

# NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

BABY BOOM

What's all the fuss on the World Wide Web about this dancing baby? Page 39

## Goin' nowhere

By Todd Wallack

Web users can't always find what they're looking for.

Sometimes finding the right Web site seems more like a black art than a science.

Just try looking up Network Solutions, Inc. (NSI), the company that doles out Internet addresses ending in .com, .org or .edu.

You might start with the logical URLs: [www.nsi.com](http://www.nsi.com) or maybe [www.networksolutions.com](http://www.networksolutions.com). But [nsi.com](http://nsi.com) comes up blank, and [networksolutions.com](http://networksolutions.com)

See NSI, page 70

## The NetPCs are coming!

Windows-based NC alternatives to debut at PC Expo.



By John Cox  
New York

The NetPC will have its coming out party this week here at PC

Expo.

Intel Corp. and Microsoft Corp. will host a major event where more than a dozen leading PC and server vendors are expected to display prototypes of their new networked clients.

Some of the NetPC prototypes should become shipping products by the third quarter.

These devices, which will serve as alternatives to traditional Windows PCs and new-fangled Java-based network computers (NC), promise to drastically reduce the cost of desktop administration. The NetPC model calls for streamlined desktop devices that can pop into existing Windows

PC networks but give network administrators more control over the applications end users can access.

Given that NetPCs have yet to ship, questions remain about how much of an impact they will

See NetPCs, page 70

## BBN deal forces shift in AT&T 'Net plan

By Denise Pappalardo

If you are thinking about jumping onto the AT&T WorldNet Managed Internet Service (MIS) boat, proceed with caution.

Two weeks ago, AT&T de-

cided that all new WorldNet MIS customers will be added to AT&T's IP network instead of BBN Planet's Internet backbone, which until now provided AT&T's dedicated business customers access to the 'Net.

Existing WorldNet MIS customers will remain on BBN Planet's network for now, according to sources close to the companies.

AT&T exclusively has used  
See WorldNet, page 72

## Netscape's busy week

FIRST LOOK

Company ships client.  
Page 8.

ANALYSIS

Users dissect latest product plans.  
Page 8.



## Taming the wild Java app

By Ellen Messmer  
Los Altos, Calif.

Start-up Digitivity, Inc. is out to cage the wild Java applet.

The company next week will begin shipping its CAGE Application Management System.

The system will give network managers a central place to store Java applets and separate those developed in-house for intranet use from potentially dangerous ones pulled from the 'Net.

Although excited about the possibilities of Java applets,

many companies also are leery of employees downloading executable code off the Internet—even from trading partner Web sites.

See Digitivity, page 72

## ISDN option opens D channel for downloads

By Tim Greene  
San Diego

A new twist on ISDN that takes advantage of the underused D channel could reward customers with lower remote access costs by year-end.

But that will depend on how much carriers charge for Always-On Dynamic ISDN (AO/DI), a new offering that relies on Basic Rate Interface ISDN's D channel to provide low-bandwidth, dedicated packet links.

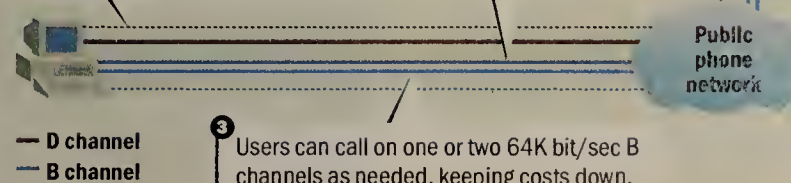
The ISDN offering, to be pro-  
See ISDN, page 72

### ALWAYS CONNECTED WITH ISDN

1 With Always-On Dynamic ISDN, the 16K bit/sec ISDN D packet channel acts as a dedicated line to a corporate network or service provider for low-bandwidth applications such as e-mail.

2 When the user calls for a high-bandwidth application such as graphics, the D channel sets up a circuit-switched connection with a B channel.

3 Users can call on one or two 64K bit/sec B channels as needed, keeping costs down.



### DUELING DESKTOP SYSTEMS

#### NetPC

##### Features:

Sealable case; hard drive; minimum Intel Pentium 133-MHz processor and 16M bytes of RAM; Windows 95 or NT; software-enabled management capabilities

##### Key backers:

Microsoft, Intel, IBM, HP and Compaq

Price: \$500 - \$1,000

#### NC

##### Features:

No hard drive, generally; StrongARM, Intel or other processor; memory varies; Java-based "operating system" and Java applications; Windows options

##### Key backers:

Sun, Oracle, IBM and NCD

Price: \$500 - \$1,000

There's more online, including a detailed comparison of the NetPC and the NC and a white paper on integrating NetPCs and your network.

[www.nwfusion.com](http://www.nwfusion.com)

2512

FUSION





*No matter what  
hardware you've  
got, we've got  
the pieces to get  
you switched.*



*Our EtherJet PC  
Card has a Wake on  
LAN™ feature, giving  
IT maintenance  
access 24/7.*



*The 8210 MSS Server  
updates you instantly  
by integrating your  
current LANs with  
new ATM networks.*



*Nway's™ management  
software helps  
you monitor LAN,  
ATM and remote  
networks.*





**the**  
“how do I turn  
the network  
I’ve got into the  
network I need?”  
**solution**

So it’s up to you to reinvent your network. Again. Maybe it’s time for an **IBM network solution**. We can integrate switching with your current technology regardless of what you’ve got floating around.

Keep your servers. Keep your routers. We’ll show you how to maximize each and every piece you’ve so painstakingly placed. Often, it’s as simple as assigning parts a new role in the greater switched scheme.


Of course, you won’t have to wait to see the benefits of IBM’s any-to-any connectivity. We can add speed and critical bandwidth to hot spots today without compromising your flexibility. Grow at your own rate. You can still reconfigure any way you’d like without starting from scratch.

For details about how **switching can make sense of what you’ve got**, call 1 800 IBM-2468, ext. DA007, or visit [www.networking.ibm.com/netad](http://www.networking.ibm.com/netad).



Solutions for a small planet™





With an every  
minute of every hour  
of every day help desk,  
all-nighters  
are all over.

Is this a great time, or what?



Circle Reader Service #11

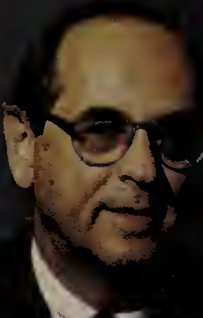
If you're living the life of the average IT professional, then you know it's a tough life. Because, after all, whatever goes wrong, guess who gets the call?

Maybe what you need is a better way of doing things, like partnering with us. That's right, MCI®, the communications people. Because you'll be surprised at how well-known we're becoming in distributed data systems. In fact, MCI Systemhouse<sup>SM</sup> is recognized by industry analysts as a leader in client/server computing. And *Data Communications* magazine just voted our end-to-end, 24/7 enterprise management service one of their "Hot Products" for 1997.

Our help desk program gives you the over-the-shoulder service that ensures your complete peace of mind. And the networks we can design, lease and monitor for you will work with all your legacy systems today, and just about anything you can imagine tomorrow. Isn't that the way computing was meant to be?

Check us out at [www.mci.com](http://www.mci.com) or call 1-800-338-6815, and start getting some sleep at night.

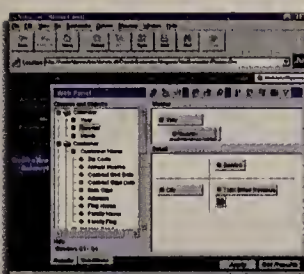




## PRIVACY PICKLE

Direct Marketing Association President Bob Wientzen says privacy guidelines for Web site operators have had little impact. Page 6.


## WEBINTELLIGENCE REPORT



Business Objects launches a Webified edition of its database query and analysis tool. Page 35.

## DIGGIN' TUNNELS

Compatible's Intraport Tunnel Server uses the 'Net to reduce remote access costs. Page 25.



### News

- 6** What does LDAP compliance mean? Two upcoming LDAP tests should help explain.
- 8** Netscape claims benefits of Beans.
- 12** Microsoft VP says there's something for business customers in the company's \$1B Comcast investment.
- 16** New IBM package promises to balance TCP/IP links.
- 73** Bus-Tech adds LAN mainframe hooks.

### Local Networks

- 19** 3Com packs Gigabit Ethernet and ATM uplinks into its first Ethernet/Fast Ethernet stackable switch.
- 19** A New edition of Solaris boasts modular features, improved Web support.
- 22** Dave Kearns: Desktop Beautification Project.
- 22** HP, Intergraph expand Windows NT server lines.

### Internetworks

- 25** South Wind design helps the help desk.
- 26** Memotec to offer new remote access switch.

### Carriers & ISPs

- 31** Nortel unveils frame, ATM performance-monitoring tools.
- 31** Cross-platform call center routing software takes off.
- 32** Daniel Briere & Christine Heckart: When mergers do you no good at all.

**SPECIAL FOCUS**

### Search Engines

Knowledge management comes to the fore. Page 42.

# NetworkWorldContents

June 16, 1997 Volume 14, Number 24

## Be a NET KNOW-IT-ALL

For the answer to this week's question and more net trivia, visit Network World Fusion and enter 2349 in the DocFinder box.



### This week's question:

What are the three "Coms" in 3Com Corp.?



[www.nwfusion.com](http://www.nwfusion.com)

### Intranet Applications

- 35** Fabrik introduces a new line of e-mail service features.
- 36** Scott Bradner: Flavors of universal access.
- 37** enCommerce limits outside access to intranets.
- 41** Study gives low grades to Web sites on their privacy policies.

### Technology Update

- 45** The Next Hop Resolution Protocol is on its way.

### Management Strategies

- 60** Research trademarks before establishing a Web site.

### Opinions

- 46** Editorial: A Gigabit Ethernet Face-off: Who's in?
- 46** Alan Pearce: Hundt's departure starts a new era for FCC.
- 47** Thomas Nolle: Finding the perfect flavor of xDSL.
- 74** Mark Gibbs: The barbarous fashion of the network biz.
- 74** 'Net Buzz: Internet start-ups having hard time hiring corporate stars.

Network Help Desk. Page 45.  
Message Queue. Page 46.  
Editorial and advertiser indexes. Page 71.

## FIND IT ON FUSION

To quickly get to any online info referenced in *Network World*, enter its DocFinder number in the input box on the home page.



### NetworkWorld

*Fusion*  
[www.nwfusion.com](http://www.nwfusion.com)

### This Week

#### Only on Fusion

**Audio primers.** IP Switching and Tag Switching get a lot of ink, but how do they work and are they something you should be looking at for your network? Find out with the latest in our series of audio primers. Listen to explanations and comparisons of the two technologies, then follow our links for more detailed overviews and news. **DocFinder: 2245**

**Management.** Boole & Babbage last week announced an upgraded version of its agent-based SAP R/3 management system. **DocFinder: 2518**

**Token ring.** IBM last week said it remains committed to token ring and plans to roll out 100M bit/sec token-ring hardware. **DocFinder: 2519**

**Middleware.** Oracle will use Java and the Common Object Request Broker Architecture to link its applications with each other and with those from other vendors. **DocFinder: 2520**

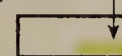
#### From the front page

**ISDN.** Read our Page 1 article on plans for the relatively unused ISDN D channel, then come online for a detailed overview of the channel and one analyst's opinion of the latest plans for it. **DocFinder: 2515**

**Java.** When you're done with our article on a start-up's proposal for keeping hostile Java applets out of end users' computers, link to Fusion for background papers on Java security. **DocFinder: 2513**

#### HOW TO GET ON TO NETWORK WORLD FUSION

At the welcome screen, click on First Visit and follow the instructions. Subscribers, keep your NWF number — highlighted on the front cover's mailing label — handy during registration. Non-subscribers must fill out an online registration form.



#### How to contact us

**WRITE:** Network World, 161 Worcester Road, Framingham, MA 01701. **CALL:** (508) 875-6400; **FAX:** (508) 820-3467; **E-MAIL:** [nwnews@nww.com](mailto:nwnews@nww.com); **CIRCULATION:** (508) 820-7444; [nwcirc@nww.com](mailto:nwcirc@nww.com)

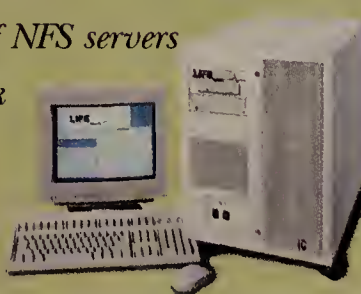
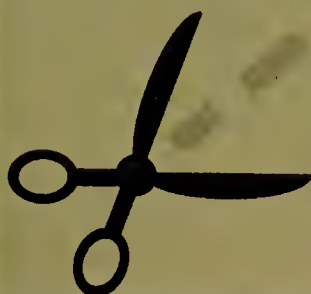
## FEATURES

### ANNUAL BUDGET SURVEY:

*Hype meets reality as survey shows functionality wins out over glitz. Page 51.*



**REVIEW:** A trio of NFS servers run neck and neck for NFS big iron bragging rights. **Page 55.**





## News briefs, June 16, 1997

## AT&amp;T's Allen eschews arrogance

■ AT&T is open to merging with a regional Bell operating company under certain conditions, AT&T Chairman and CEO Robert Allen said for the first time last week.

Without specifically confirming AT&T's widely reported merger talks with SBC Communications, Inc., Allen told the Chief Executives Club of Boston that such a combination could kick-start AT&T's entry into the local telephone business.

"We still have a lot to learn about cracking markets that are too closed and mastering [local exchange] systems that are too complex," Allen said. "And we are not so proud or arrogant to turn away from opportunities to acquire those skills."

Allen said a deal with SBC Communications, Inc. could spur the RBOC to "embrace the vision" of competition, thus speeding up telecom reform instead of hindering it. SBC, which owns Pacific Bell, Nevada Bell and Southwestern Bell Corp., has been regarded as an especially militant RBOC in blocking competitive initiatives, particularly in Texas.

## Mega-merger mania

■ It's official. 3Com Corp. and U.S. Robotics last week announced that shareholders of both companies voted to approve the previously announced merger of the two companies. Under the terms of the merger agreement, first announced on February 26, shareholders of USR will receive 1.75 shares of 3Com stock for each share of USR stock they hold. The value of the merger is \$8.5 billion.

The mega-merger gives 3Com strong positions in the LAN switch, network interface card, remote access and modem markets. The combined company will keep the 3Com name and will be headed by Eric Benhamou, who will remain as chairman and CEO. Former USR CEO Casey Cowell will become vice chairman of 3Com's board of directors.

## The Big Bill

■ In an effort to raise federal revenue, budget makers have revived a previously dormant proposal to auction off some 300,000 toll-free numbers beginning with the area code 888, *Network World* has learned.

The move could cost users as much as \$750 million, according to past estimates by the Congressional Budget Office. The proposal is part of the recent balanced-budget agreement between the Clinton administration and congressional leaders.

Early last year, the Federal Communications Commission made 888 numbers unavailable after 800 vanity number-holders expressed fear that competitors could create market confusion by grabbing the 888 equivalents of numbers such as 1-800-FLOWERS.

## Communicator breakdown

■ Netscape Communications Corp. confirmed Friday the existence of a security bug in its Communicator Web Browser component that also affects Navigator 2.X and 3.X. The bug allows a Web site author or administrator to access the hard drives of those browsing the site. The administrator, however, would have to know or guess the name of particular files.

Netscape is posting a fix for Windows 95 and NT early this week. Other platforms will follow. The bug has existed for a year and a half, Netscape said.

In a weird twist, Netscape officials said the Danish Internet consultant who found the bug in Communicator demanded compensation for details about the bug and threatened the company with public exposure.

The consultant, Christian Orellana of Cabocomm, a Danish Internet consultancy, did not comment on the allegations. Netscape said it posts updates on the bug at [www.netscape.com/](http://www.netscape.com/).

## Merger mates



Benhamou



Cowell

## FTC hearings spotlight 'Net privacy

By Ellen Messmer

Washington, D.C.

The common practice of collecting personal information on Web visitors without letting them know how it will be used is slowing electronic commerce on the Internet.

That point was driven home last week at the Federal Trade Commission's "Consumer Information Privacy" hearings here, where database service representatives, privacy advocates and others debated the desire to make money through marketing consumers' personal data vs. an obligation to protect data privacy.

According to the consumer privacy poll released here last week by Louis Harris & Associates (see graphic), consumers are reluctant to buy goods off the 'Net because online merchants are not telling them what they are doing with the personal data

they collect.

People said they would buy more off the Internet if they knew the privacy policies for the companies whose sites they visit.

But adding privacy policies can cost Web site



"We are going to require that Web sites have a posted privacy policy, whether they collect information or not," says Wientzen.

operators money, too. *The New York Times* was shocked to see itself in an unfavorable light in the Electronic Privacy Information Center (EPIC) Web privacy study released last week (see story, page 41). It consequently spent \$70,000 to formulate a privacy policy that gives subscribers a way to opt out of the publisher's Web marketing databases.

"We quickly added a privacy policy after reviewing the EPIC study," Martin Nisenholtz, manager of the *Times*' Web site, told the commission.

In another twist on privacy, Internet users can now look up tremendous amounts of personal data about individuals.

At the hearings, Internet online database vendors admitted that the way they now offer Internet "look-up" services detailing individuals' credit reports and buying habits may be violating federal rules.

The rules prohibit distributing this information except to

professionals such as mortgage processors or law enforcement officials.

WDIA Corp.'s National Credit Information Network used to offer its services only to business professionals, but "we now allow

The DMA last January issued guidelines that tell Web site operators to disclose the types of data they collect and to give visitors a chance to exclude themselves from being added to Web-based databases.

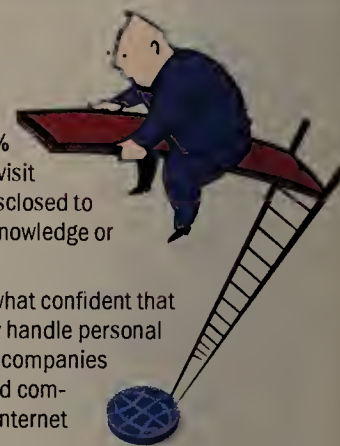
## LACK OF CONFIDENCE

A sampling of findings from a recent survey on privacy issues.

- 53% of end users are very concerned and 36% are somewhat concerned that Web sites they visit will be linked to their e-mail addresses and disclosed to another person or organization without their knowledge or consent.
- 75% of computer end users are very or somewhat confident that employers, banks and hospitals appropriately handle personal or confidential information. But confidence in companies providing Internet services, online services and companies offering products and services on the Internet drops to about 45%.
- Of the 58% of Web site visitors who have been asked to provide information when visiting a site, 79% have declined at some point to provide that information, and 8% said they have provided false information. But 63% would have supplied the information if told how it would be used.

Based on a survey of 1,009 computer users across the U.S.

SOURCE: LOUIS HARRIS & ASSOCIATES AND COLUMBIA UNIVERSITY PROFESSOR ALAN WESTIN



searches by the general public over the Internet," said company President Mark Hanna. He said the data was being recombined from many sources — some of which he did not even know.

Gerald Cerasale, senior vice president of the Direct Marketing Association (DMA), said providing a lookup service for marketing lists is against DMA guidelines.

But DMA President Bob Wientzen admitted to the commission that these guidelines have had little impact.

However, the DMA will now get tough on its 3,600 members. "We'll be releasing the names of those who refuse to comply," Wientzen said.

It may be too little, too late. There are almost a dozen bills pending in Congress that would regulate online content. ■

## Putting directories to the test

By Christine Burns

Vendors of Lightweight Directory Access Protocol-based (LDAP) products are bracing for two separate testing events in upcoming weeks that will demonstrate whether their products live up to the directory technology's promise.

IBM, Microsoft Corp., Netscape Communications Corp. and Novell, Inc. are among the companies that will submit their directory offerings to a series of LDAP 2 tests spearheaded by the Network Applications Consortium (NAC) and others. The vendors also will participate in a test of planned LDAP 3 products hosted by the Internet Mail Consortium (IMC).

For 18 months, LDAP has been heralded as essential to finding and accessing information stored in different vendors'

directory servers located on corporate networks or the Internet.

But as with most standards, nothing comes easy. For instance, even though LDAP 2 has been deemed an IETF standard, observers said it is wide open to interpretation upon implementation in products. And in the name of competitive advantage, vendors are adding proprietary features to their LDAP-based products that may not interoperate with competing products.

The end result is that buyers must be aware of just what LDAP-compliant means. Fortunately, the upcoming tests should be a good reality check.

A series of tests for shipping LDAP 2 wares — dubbed the Directory Interoperability Rendezvous (DIR) — has been spear-

See LDAP, page 12



We've worked with over 21,000 companies.  
That's a lot of bosses to keep happy.



Headquarters: Herndon, VA  
Email: info@psi.com

*Call them!  
They have  
the experience  
we're looking for.*

**Job Title:**  
Global Internet Service Provider

**Work Experience:**  
1984 to 1989 — Our founders helped create the Internet. Then they created PSINet to make it work for business.

1989 to present — Primary responsibility is providing Internet access that is unsurpassed in reliability, integrity and scalability. Areas of expertise include high-performance internetworking solutions, electronic commerce, Internet security and Web hosting.

**Special Skills:**  
Strength — in being the world's only network built, owned and operated specifically for the Internet. Flexibility — in being the only provider that is ISDN-compatible in every Point of Presence (POP). Reliability — in having a dynamic, high-performance frame relay-based backbone network. Experience — in having more than 500 employees committed to providing quality products, services and support.

**Accomplishments and Awards:**  
First to provide commercial Internet access. First to offer ISDN. First to provide dial-up capability. First to offer managed Internet security. First to offer fax capability over the Internet.

Named Best Internet Access Provider 1996, *Network Computing Magazine*.

Named Editors' Choice Internet Service Provider 1995, *PC Magazine*.

Founding Organizational Member of the Internet Society.

**References:**  
Thirty-seven of the Fortune 100 companies and more than 21,000 forward-thinking medium and small companies worldwide, including: American Airlines, American Medical Management, Austin International, KP Group and SkyTel.

**Hobbies:**  
Street hockey. Softball. Surfing the Net. Chess.

USA • CANADA • EUROPE • JAPAN • UNITED KINGDOM

PSINet provides premier Internet access on have the technology, training and expertise to that will make any boss very, very happy.  
the most reliable network in the world to companies the solution that best fits your business. We provide  
of virtually all types and sizes. Since 1989, we've tools that allow you to increase productivity and  
helped the technology evolve. PSINet was first to reduce costs, from email and Web access, to  
provide commercial Internet access. First to offer electronic commerce and networked applications.  
ISDN. First to offer managed security. And the list And our reliable network ensures that those tools  
goes on. So what does this mean to you? It means we are there when you need them. It's a combination

**Call now to get  
one month free.  
1-800-785-2292**

Or visit us at [www.psi.net/er2/](http://www.psi.net/er2/)



Offer valid through June 30, 1997, for all PSINet corporate Internet access services in the United States and Canada. Minimum contract term applies. Cannot be combined with any other offer. Please call for complete details.



## FIRST LOOK

# Communicator sets a new standard

By Lee Schlesinger

Forget the Netscape vs. Microsoft religious wars. The time for talking is over. Now it's crunch time because the first of the companies' ambitious new Internet client packages — Netscape Communications Corp.'s Communicator — hit the market last week.

Communicator is more than the next version of Navigator — it's a whole suite of tools that addresses browsing, messaging, discussion groups, content creation, push/pull technology and more. We found it excellent in some areas — notably Navigator and the Netcaster push/pull facility — and adequate in most others, but overall a superior value.

The \$59 Communicator client Standard Edition includes six applications that aim to handle all your Internet collaboration needs, while the \$79 Professional Edition adds enterprise features for calendaring, host connectivity and administration. Netcaster is still in beta testing.

Netscape Navigator is still at the top of the list of Communicator applications. Usability is improved with features such as the ability to drag a URL to a subfolder within the bookmarks folder, collapse and expand toolbars with a click and access a Personal Toolbar that lets you click on frequently used URLs.

Netscape has added support for the Lightweight Directory Access Protocol, which helps integrate Communicator neatly with other LDAP-compliant services, including Internet white page sites such as Four11.

LDAP is also supported by Messenger, the enhanced e-mail component, which offers hierar-

chical folders and address books. We found Messenger's interface to be a little funky — it has a tabbed toolbar for specifying the recipient's address, with separate tabs for attachments and new options such as encryption, digital signature and return receipt.

## NetResults

<b>Product</b>	<b>Netscape Communicator</b>
<b>Vendor</b>	Netscape Communications Corp.: (415) 937-2555 www.netscape.com
<b>Price</b>	Standard Edition \$59 Professional Edition \$79
<b>Pros</b>	<ul style="list-style-type: none"> <li>• Wealth of integrated applications</li> <li>• Best browser available</li> <li>• LDAP support in messaging client</li> </ul>
<b>Cons</b>	<ul style="list-style-type: none"> <li>• Newsreader features lag behind those of browser</li> <li>• Messenger interface is not intuitive</li> <li>• Mediocre Composer page-creation tool</li> </ul>

But Messenger now includes a healthy set of filters that lets you take action on received messages. It also supports Internet Message Access Protocol 4, which enables you to leave your messages on the server where you can access them easily wherever you are. Features like these make Messenger a viable alternative to a separate mail client.

Communicator also covers conferences with Collabra discussion groups. The Collabra client has been rewritten to use the Network News Transport Protocol. So you can use it as a Usenet newsgroup reader. You even can create virtual discussion groups that are subsets of larger groups or read messages on your own intranet conference server.

These three applications are the core of Communicator Standard Edition. But for the same price, you also get Netscape Composer, an entry-level Web page composition program, and Netscape Conference, which lets you use voice, text chat and a shared white board with others on the Internet.

For \$20 more, you can get Communicator Professional Ed-

ition, which includes applications designed for heavy-duty collaboration needs. The most useful is Netscape Calendar, a client of the company's Calendar Server. It gives you the ability, albeit limited in scope, to publish and share scheduling information, including scheduling multiple users.

The Professional version also includes a 3270 emulator for access to IBM mainframes from the browser.

Real enterprise sites will want the Professional Edition for Netscape AutoAdmin. In conjunction with a separate server-side tool called Mission Control, AutoAdmin lets you set client configuration information — such as home page, mail server address and menu items — and lock items you don't want users to change.

The coolest component of Communicator — Netcaster — will be an integral part of both editions of Communicator after

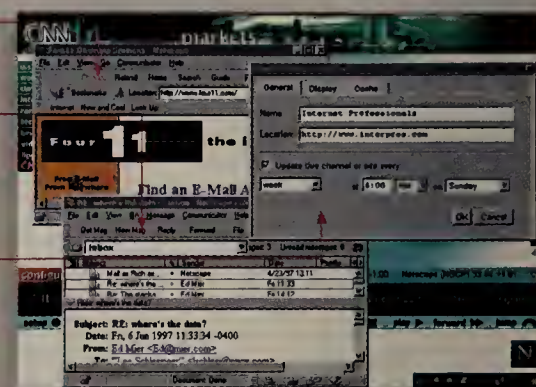
another month or so of development. With Netcaster, you can subscribe to push channels, receive automatic updates at user-defined intervals and tune

ing client is now good enough that you may not need a separate product — that alone could be enough for cost-conscious organizations to justify the nominal

## FIRST LOOK: NETSCAPE'S COMMUNICATOR

Though you can't see it on the printed page, this Netcaster webtop is full of active, moving content ...

- ... yet you can still browse the Web ...
- ... or exchange e-mail (or work on other other applications).
- You can also add channels or sites to Netcaster through a simple configuration screen.



in to channels via Web technology or an integrated Marimba, Inc. Castanet Tuner. There's an offline browsing capability and a feature that lets you broadcast software to multiple desktops.

Is Netscape Communicator worth a place in your organization? The short answer is yes. Its Navigator Web browser is the best in the business. The messag-

price of the product. The Collabra newsgroup reader is adequate, though power users will still want a more full-featured application. Composer is fine for the weekend Web author but inadequate for power developers. But toss in the other components, plus a wealth of third-party plug-ins, and you have a package that's a real value. ■

## ANALYSIS

# Netscape climbs hill of 'Beans'

By Carol Sliwa  
San Jose, Calif.

Last week at its Developer Conference (DevCon), Netscape Communications Corp. threw its now substantial weight behind Sun Microsystems, Inc.'s JavaBeans component model as a way to support "crossware" — applications that run across networks, operating systems, databases and devices and link business partners and customers.

JavaBeans will serve as the component model for Netscape's Open Network Environment, an application environment that relies on the Internet Inter-ORB Protocol (IIOP) for distributing applications over the Internet, intranets and extranets.

"We will provide a way to use Beans to interconnect Java, HTML and JavaScript," said Rick Schell, Netscape's senior vice president of product development. "Before, JavaBeans were used [only] for Java."

Enterprise developers attending DevCon in San Jose welcomed the news, saying it can help solve real business prob-

lems. Hong Kong Telecom International, Ltd., for instance, makes billing information available to customers over the Internet. Right now, those customers can log on to the telephone company's Web site and gain access to billing information that has been stored in an Oracle Corp. database.

But Hong Kong Telecom had to consolidate that information from a variety of mainframe databases, located in different places, and then enter the records into the Oracle database. Through IIOP, the company hopes to eliminate that step and enable all databases to communicate with each other, according to conference attendee James Latham, an Internet application developer for Hong Kong Telecom.

Under the new model, the customer would access the system through a Web browser, as usual. This time, however, the client request would be passed to a JavaBean object located on a Web server. The Web server's object request broker would then pass the request to an ORB on a transaction processor. The transaction processor's ORB

would relay the request to the ORBs running on multiple databases.

JavaBeans help lower costs because the components can be reused, Latham said. The Beans help with management because they contain information tags that make it easier to manage code libraries, Latham added.

DAT Services, based in Beaverton, Ore., hooks up trading partners in the trucking industry over the Internet. Transactions are now passed via a proprietary protocol. Trading partners use custom client software to access the database information via the Sprint Corp. network or private phone lines, and the information they need is sent back via data packets.

But DAT wants to let customers access its database through a Web browser. With this approach, the request would be made through a JavaBean. An ORB would pass the request through a transaction processor to the database ORB.

"The advantage of the Beans is that you write them once, they'll run on any platform. That's really attractive," said Rick Combest, a DAT product development manager. The Beans also are easy to build and link with tools, he said.

See Netscape, page 16

Go online for:

- An expanded version of this review
- Your own version of Communicator
- Information from the recent Netscape Developer's Conference

2517





## FREE! PowerChute® plus software with all 120V Smart-UPS®.



Smart-UPS now ships with Free PowerChute® plus! LAN, WAN and web servers all benefit from new Smart-UPS® Network Bundles... Now the most reliable power protection solution comes in one box!

☐ **YES!** Please send me information about new Smart-UPS Network Bundles.

☐ **NO,** I am not interested in Smart-UPS Network Bundles at this time.  
But I would like a FREE ☐ Handbook\* ☐ Demo Disk\*

Name: \_\_\_\_\_

Title: \_\_\_\_\_ Company: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ Ctry: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Brands of UPS used: \_\_\_\_\_ # \_\_\_\_\_

Brand of PCs used: \_\_\_\_\_ # \_\_\_\_\_

Brands of Servers used: \_\_\_\_\_ # \_\_\_\_\_

\* Allow 6 - 8 weeks for delivery.  
Please fill in all information completely for prompt service.

# APC®

Dept. E2-SU

(888) 289-APCC x7017

Fax: (401) 788-2797

<http://www.apcc.com>







NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

**BUSINESS REPLY MAIL**

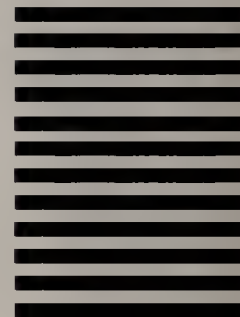
FIRST-CLASS MAIL PERMIT NO. 36 WEST KINGSTON, RI

POSTAGE WILL BE PAID BY ADDRESSEE



AMERICAN POWER CONVERSION

DEPT. BRC-E2-WEB  
132 FAIRGROUNDS ROAD  
PO BOX 278  
WEST KINGSTON RI 02892-9920





# Now that APC Smart-UPS® includes FREE web-enabled PowerChute® *plus*, server protection has never been easier



"...Inherent flexibility and excellent software... Don't be caught without one."

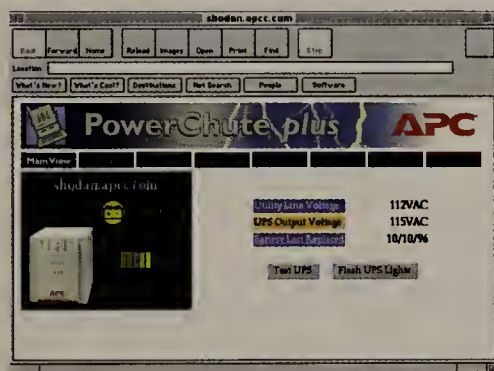


Power problems attack networks relentlessly. To protect hardware and data from system crashes, experts, network managers and computer users worldwide prefer one solution above all others combined: APC Smart-UPS. Now, all 120V Smart-UPS include FREE PowerChute *plus* power management software.

## The most reliable protection you can buy

Smart-UPS provide complete protection against power spikes, surges, brownouts, and blackouts. You'll also gain maximum server up-time and decrease management costs. Award-winning features include:

- CellGuard™ intelligent battery management monitors battery performance and extends battery life.
- SmartSlot™ internal accessory slot lets you customize and enhance the performance of your Smart-UPS.
- QuickSwap™ user-replaceable batteries can be quickly and safely swapped out without powering down the connected equipment.



PowerChute *plus* provides unattended system shutdown and UPS management for Windows NT, Netware and other servers. Manage Smart-UPS via SNMP, DMI and Web browsers (shown above). Features vary by operating system.

## Plan for and control crisis situations

PowerChute *plus* FlexEvents™ lets you control UPS reactions to power events.

You can configure PowerChute *plus* to provide graceful, unattended server shutdown during an extended power outage or alert you to out-of-bounds environmental conditions before they result in costly downtime.

## Web server & SNMP ready

APC's NEW WebAgent™ allows you to monitor and manage your Smart-UPS using your Web browser.

New WebAlert™ notifies users of Web server shutdown via their browser. PowerChute *plus* also includes the PowerNet™ SNMP Agent plug-in, which allows you to integrate your

Smart-UPS with your existing SNMP management strategy.

Smart-UPS and PowerChute *plus* provide the complete solution in one convenient box.

Server protection and peace of mind have never been easier.

## Trade-UPS!

Fax or mail this coupon to APC and learn how you can easily trade in your old UPS for discounts towards a new Smart-UPS.

☐ **YES!** I'm interested in trading up a competitors' or an older APC UPS to Smart-UPS. Please send Trade-UPS info.

☐ **NO,** I'm not interested at this time but please send my FREE power protection handbook.

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City/Town: \_\_\_\_\_

State: \_\_\_\_\_ Zip: \_\_\_\_\_ Country: \_\_\_\_\_

Phone: \_\_\_\_\_

Brand of UPS used? \_\_\_\_\_ # \_\_\_\_\_

Brand of PCs used? \_\_\_\_\_ # \_\_\_\_\_

Brand of Servers used? \_\_\_\_\_ # \_\_\_\_\_



Dept. E2-SU

(888) 289-APCC x7017

Fax: (401) 788-2797

<http://www.apcc.com>

APC has won more awards for reliability than all other UPS vendors combined.





Mobile<sup>3</sup>





# CardBus *really* Connects

*3Com hits the market with the Fast EtherLink® XL CardBus PC Card, the fastest 10/100 connectivity in a new CardBus package. Pow!*

Give your mobile users a powerful punch. Outfit your new, 32-bit high performance CardBus notebooks with the fastest 10/100 PC Card in the industry. Only notebooks supporting the CardBus standard provide full 100 Mbps network performance, and only 3Com combines a 32-bit architecture with lightning-fast Parallel Tasking® technology that is a full 24%\* faster than other leading CardBus PC Cards.

The Fast EtherLink XL card not only packs a wallop with 100 Mbps throughput, it also supports 3Com's unique DynamicAccess™ features designed to improve overall network performance and manageability. Also, the Fast EtherLink XL card comes with a full lifetime warranty and is guaranteed compatible with leading CardBus notebooks. And here's another bell-ringer: 3Com's Fast EtherLink XL CardBus PC Card keeps your notebooks running extra cool and safe by drawing at least 50% less power than any other CardBus PC Card on the market.

Now that 3Com has set the standard for Fast Ethernet CardBus performance, who else do you need in your corner?

Call now to get your evaluation unit  
for just \$95\*\* or a free information kit  
on CardBus while supplies last.

1-800-NET-3COM (option 4)  
[www.3com.com/pccard](http://www.3com.com/pccard)





# Microsoft exec puts business spin on \$1B Comcast deal

Broadband pipes may lead to better product support and management capabilities for Windows users, according to VP Maffei.

**QA** Microsoft Corp. last week made the biggest single investment in its history when it dropped \$1 billion into the coffers of Comcast Corp., the nation's fourth-largest cable television company.

The move was seen largely as an effort to boost the speed with which Comcast could lay down the broadband pipes Microsoft needs to deliver its growing repertoire of content-based services to homes.

But Greg Maffei, Microsoft's vice president of corporate development, last week told *Network World* Senior Writer Christine Burns that there is something in the deal for business customers, too.

**What are the implications of the deal for business customers?**

There will be several areas where corporate customers will benefit from more bandwidth overall. It's product support. It's

maintenance. And potentially it is a better, easier, faster way to get software updates out to all of your corporate machines. One of our goals is to bring better technologies to market for managing Windows PCs across the 'Net. That means all things from regularly updating your software to doing maintenance. Advanced versions of products like Systems Management Server will basically tell us what is on your system, allowing our service center to better deliver product support.



Microsoft's Maffei wants infinite bandwidth.

**How strategic is increasing bandwidth compared to, say, Windows NT development, which Microsoft says it will spend \$1 billion on this year?**

Only the figures are comparable because we invest in R&D in a different way than we do in terms of investing in other industries.

We like to think that all of our investments are strategic, but it would be hard to argue that NT,

which is the core of the company's operating system business, is in the same category as our interest in the cable industry.

**Was this investment an indication of Microsoft's frustration that the cable industry wasn't moving quickly enough to get a broadband infrastructure in place?**

We are frustrated that there isn't an infinite amount of bandwidth. Everyone who has tapped into the Internet has experienced that frustration.

I prefer to say that we believe it can go faster, and we were willing to invest in that belief. Our hope would be that people who believe in our agenda or don't believe in our agenda would agree that we need more bandwidth from every source.

**Is Microsoft planning to make other investments in the cable industry?**

We aren't talking to anybody

now and don't have any other plans to make this a standard practice. But you never say never. Our real hope is that we spur others who believe in bandwidth to make this kind of investment.

**Does this endorsement affect the work you have done with the telco industry on the development of other high-speed links?**

No. We are running trials on [asymmetric digital subscriber line] with several partners and expect to accelerate those trials in the coming months. This was not meant to be an endorsement of only one technology over another as much as an endorsement of better bandwidth.

**It seems as if Microsoft is taking an increasing interest in the WAN over the LAN. Is that where you see new business going?**

This is an endorsement of a particular wide-area technology, but by no means are we denigrating LANs with it. Just because we

## NetworkWorld

Editor In Chief: John Gallant

Editor: John Dix

### NEWS

News Editor: Doug Barney

News Director: Bob Brown

Associate News Editor: Michael Cooney

Phone: (508) 875-6400

Enterprise Editor: Charles Bruno

Phone: (407) 381-7801; Fax: (407) 381-7903

### NETWORK WORLD FUSION

Online Editor: Adam Gaffin, Phone: (508) 820-7433

Online Senior Writer: Todd Wallace,

Phone: (508) 820-7532; Fusion Designer: John Fischer

### LOCAL NETWORKS

Senior Editor: Jodi Cohen, Phone: (508) 820-7449

Senior Writer: Christine Burns,

Phone: (508) 820-7456

### INTERNETWORKS

Senior Editor: Jim Duffy, Phone: (508) 820-7525

Senior Writer: Tim Greene, Phone: (508) 820-7422

### CARRIERS & ISPS

Senior Editor: David Rohde

Phone: (202) 879-6758; Fax: (202) 347-2365

Senior Writer: Denise Pappalardo

Phone: (202) 879-6745; Fax: (202) 347-2365

### INTRANET APPLICATIONS

Senior Editor: John Cox, Phone: (508) 834-0554,

Fax: (508) 834-0558; Senior Editor: Ellen Messner,

Phone: (202) 879-6752, Fax: (202) 347-2365,

Senior Writer: Paul McNamara, Phone: (508)

820-7471; Senior Writer: Chris Nerney,

Phone: (508) 820-7451; Senior Writer: Carol Sliva,

Phone: (508) 820-7427

### COPY DESK/LAYOUT

Managing Editor: Michele Caterina

Senior Copy Editor: Sandra Gitten

Copy Editor: Melissa Adams

### ART

Design Director: Rob Stave

Associate Art Director: Tom Norton

Senior Designer: Allyson Nickowitz

Graphic Designers: John Fischer, Paul M. Lee

Graphics Coordinator: Pauline Chouinard

### FEATURES

Features Editor: Paul Desmond,

Phone: (508) 820-7419, Fax: (508) 820-1103

Managing Editor, Features: Amy Schurr,

Phone: (508) 820-7485, Fax: (508) 820-1103

Associate Features Editor: Susan Collins,

Phone: (508) 820-7413, Fax: (508) 820-1103

Senior Editor, Features: Kathy Scott,

Phone: (508) 820-7489, Fax: (508) 820-1103

### REVIEWS

Test Center Director: Lee Schlesinger

Phone: (508) 820-7416

Senior Editor, Tests and Reviews: Jim Brown

Phone: (508) 820-7408; Fax: (508) 820-1103;

E-mail: bill\_rinko-gay@pcworld.com

Test Alliance Partners: Stephen Cobb, Cobb Associates;

Todd Cooper, Trinity College; James Gaskin, Gaskin

Computer Services; Steven Goldberg, G Systems; Bob

Larribau, Larribau Associates; Howard and Kristin

Marks, Networks Are Our Lives; Edwin Mier, Mier

Communications, Inc.; National Computer Security

Association; Joel Snyder, Opus One

Contributing Editors: Daniel Briere, Mark Gibbs,

James Kobelius, Edunn Mier, Mark Miller, Alan Pearce

Buyers Guide Contributors: Tony Groes, Linda Musthaler,

Currid & Co.; Mark Miller, DigaNet Corp.; James

Kobelius, ICG, Inc.; Edunn Mier, Mier

Communications, Inc.; Daniel Briere, Melodie Reagan,

Christine Heikart, Liza Henderson, Beth Gager,

TeleChoice, Inc.

Teletoons: Phil Frank, Joe Trous

### INTRANET

Executive Editor: Beth Schultz, Phone: (773) 283-

0213, Fax: (773) 283-0214

Senior Editor: Peggy Watt, Phone: (415) 903-9519,

Fax: (415) 968-3459

Art Director: Tom Norton

Assistant to the Editor: Cheryl Crivello

Office Manager, Editorial: Glenna Fasold

Editorial Assistant: Pat Josefek

## LDAP

Continued from page 6

headed by the NAC, a large corporate users group, as well as The Burton Group consultancy and engineers from the University of Michigan, LDAP's birthplace.

A test suite developed at the university gauges how different vendors' products handle authentication and binding of LDAP clients to the directory, basic searching capabilities, the time it takes to answer a client request and how the directory can be modified and updated.

Vendors will run the tests internally before they are expected to run them publicly and will announce the results at a conference The Burton Group is holding next month.

Tim Howes, one of LDAP's authors and a product manager at Netscape Communications Corp., said the tests will not yield pass/fail marks. Instead, the testing group is formulating specific categories for which the individual products comply.

Jeff Hodges, directory services project manager at Stanford University, said he hopes the tests will provide users with assurances of baseline confor-

mity for servers and guarantees that different clients will get identical responses from LDAP servers.

"An organization may not have any control over the set of clients users will use [because] they are able to simply download almost anything off the Internet and give it a go," Hodges said.

The other LDAP test — dubbed the DIRConnect LDAP interoperability event — will take place this week in San Jose, Calif. It will be run by the IMC.

This event is designed to give the dozen participating vendors a forum to test interoperability among yet-to-be-released client and server products based on LDAP 3, said IMC Director Paul Hoffman.

"It's just a bunch of engineers sitting on the same network hammering on the protocol, trying to find out how we can deliver more features that work together across servers," said Chris Weider, program manager for LDAP at Microsoft.

Microsoft will be testing its upcoming NT 5.0 Active Directory service at this event. This testing will accelerate the pace at which advanced LDAP products will be brought to market, he said. ■

## Fast Ethernet

### Cisco broadens LAN hub portfolio

By Jim Duffy

San Jose, Calif.

Cisco Systems, Inc. last week bolstered its high-speed LAN prowess with the rollout of new Fast Ethernet hubs.

Cisco announced two additions to its FastHub line of 100Base-T Ethernet repeaters and lowered prices on existing Fast Ethernet hubs.

Cisco's new FastHub 216T, starting at \$150 per managed port, is designed for small workgroups and server farms.

The new FastHub 116T, part of the FastHub 100 series of stand-alone, unmanaged 100Base-T repeaters, is priced at \$87 per port and targeted at power workgroups and users.

A Carlsbad, Calif.-based health club chain called 24-Hour Fitness is using the new hubs to speed access to network applications and prepare for future

gigabit speeds.

"I don't need to deliver switched bandwidth to the power users that I have," said Steve Hallett, technical support manager at 24-Hour Fitness. "I'm trying to get them on 100M bit/sec in anticipation that I'm going to shared gigabit from high-end servers at the end of this year or the first part of 1998. I'm just going to scale everybody up."

Cisco also is lowering the price of its manageable FastHub 300 stackable repeaters by as much as 14% to \$1,995 for the FastHub 316T and \$2,395 for the FastHub 316C.

Prices for the 16-port 100Base-TX expansion module and the Network Management Module for the FastHub 300 series have also been reduced by more than 30% to \$1,795 and \$1,195, respectively.

© Cisco: (408) 526-4000

### Cisco's new Fast Ethernet hubs

Product	Description	Price	Availability
FastHub 116T	16 unmanaged 100Base-TX ports	\$1,395	July
FastHub 216T	16 managed 100Base-TX ports	\$2,395	Now



**When's the best  
time to talk  
about remote  
access expertise?**

**Your Sales  
Manager just spent  
an hour trying  
to dial in.**

**He thinks it's now.**

There's nothing more frustrating than not being able to get the information you need when you need it. But you've probably been told that already.

We can help. We're Cisco. The world leader in networking. Virtually every message that travels across the Internet travels across Cisco equipment.

It's this kind of experience that makes us uniquely qualified to handle your remote access needs.

We have a complete range of solutions for everyone from the central site to your mobile users, work-at-home folks and dedicated telecommuters.

So let's talk today.

Call 1-800-778-3632 ext.189000 for our free Product Selection Tool and Telecommuting Guide on CD. Or visit us at [www.cisco.com/access/dialup/](http://www.cisco.com/access/dialup/)

**CISCO SYSTEMS**



The network works. No excuses.™





ANYTIME TWO COMPANIES LIKE

COMPAQ AND MICROSOFT

*get together*

YOU CAN EXPECT A LONG LIST OF

IMPRESSIVE RESULTS.

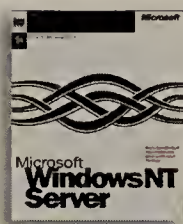


SAY WE START WITH \$1,000 IN SAVINGS.



Compaq  
ProLiant 2500

+



Microsoft  
Windows NT®  
Server

+



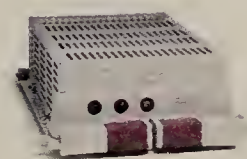
Microsoft®  
SQL Server™

+



SMART-2 Array  
Controller

+



4.3GB or 9.1GB  
hard drive



Buy a Compaq ProLiant 2500, Microsoft Windows NT® Server, SQL Server,™ SMART-2 Array Controller and a 4.3GB or 9.1GB hard drive and get \$1,000\* off the total purchase price.

THIS *exceptional* OPPORTUNITY FOR SAVINGS AND EXTRA VALUE IS *only* AVAILABLE UNTIL JULY 31ST.

See your reseller, or for the one nearest you call 1-800-853-9526, or visit us at [www.compaq.com](http://www.compaq.com)



\*All prices and price reductions shown refer to U.S. estimated reseller prices. Actual reseller prices may vary. Free offer with purchase of qualifying product from a participating reseller from 4/28/97 to specified end date, while supplies last. Offers not valid on Compaq refurbished products. All others are subject to product availability, and are valid only in the U.S. Compaq reserves the right to change, alter or cancel these programs at any time without notice. ©1997 Compaq Computer Corporation. All rights reserved. Compaq registered U.S. Patent and Trademark Office. ProLiant is a registered trademark of Compaq Computer Corporation. Microsoft, Windows NT, and Microsoft SQL Server are registered trademarks of Microsoft Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies.



# IBM seeks to ease server load

By Michael Cooney

Raleigh, N.C.

New router-based software from IBM is aimed at relieving overburdened TCP/IP servers.

At a briefing with *Network World* this week, IBM executives said this summer they will give users a way to balance heavy TCP/IP traffic among groups of servers by porting its Net Dispatcher load-balancing software onto its new 2216 Multi-access Concentrator.

By freeing busy servers, the package will give end users faster access to server resources. The router also can send traffic around failing servers, and administrators can add new servers without taking down existing boxes.

Net Dispatcher is the software IBM used to manage the huge amount of traffic generated by its Summer Olympics Web site last year. In its first iteration, Net Dispatcher ran on IBM's SP2 and RISC System/6000-based servers (NW, Oct. 7, 1996, page 12). The 2216 router supports SNA and TCP/IP communications over Ethernet or token-ring LANs and a vari-

ety of WAN links, such as frame relay and Synchronous Data Link Control.

"We are trying to make TCP/IP-based environments as reliable and efficient as SNA networks and services have been in the past," said Rick McGee, vice president of strategy and business development for IBM's Networking Hardware Division.

Sitting in front of a TCP/IP-based server farm, the 2216/Net Dispatcher automatically discovers server addresses and can, by user-defined parameters, direct incoming traffic to the least-busy box. If a server crashes, the 2216 will redirect traffic to another server. New servers easily can be brought online and old servers can be taken offline for maintenance without disrupting usage, IBM said.

IBM executives also said last week:

- They are committed to ATM development, but they want to "move rapidly" to add Gigabit Ethernet support to their existing product line and add stand-alone Gigabit Ethernet switches to the family. Whether IBM gets into the Gigabit Ethernet wars by building its own

products or buying a Gigabit Ethernet vendor remains to be seen. "We're not exactly sure how we're going to get there yet," McGee said.

- Support for faster token-ring nets is on the way. While IBM declined to say what speed its new Token Ring products would achieve, executives did say the speed would be more than 100M bit/sec. The company said the new speeds would be achieved in a pure token-ring environment, not the fast token-ring-over-Ethernet plan espoused by Cisco Systems, Inc. and others (NW, page 1, May 26).

- The company this fall will ship its first multilayered switch, dubbed the Integrated Switch Router (ISR) (NW, March 24, page 10). The ISR will be built on IBM's ATM-based Prisma chip technol-

## 2216 ROUTER STAR IS RISING

IBM will soon add a variety of new strategic features to its 2216 router. The features will support:

- Net Dispatcher load-balancing software
- tn3270 server
- 100M bit/sec Fast Ethernet
- FDDI
- High-Speed Serial Interface



ogy and will support at least a 12G bit/sec backplane. The ISR will be aimed at users building large, switched backbones and Internet service providers. ■

## Lotus to unveil Domino for dummies

By Paul McNamara

Cambridge, Mass.

Lotus Development Corp. knows the rap all too well: Its Notes and Domino products are too complex for businesses that want to make hay on the Web but cannot afford big-time IS departments.

Lotus will aim to change that perception this week at PC Expo in New York with the introduction of a Domino-based Web server and applications package — code-named "Club Med" — that the company claims can be deployed with little Notes expertise. Sources said the package will include a version of the Domino server designed for getting smaller companies started on the Web, a Web site development tool on Lotus' Domino. Action software and a bundled set of up to a dozen ready-to-use Web applications, including a contact manager.

"If you're a small company, it's been too hard for too long to install [Notes and Domino]," a source close to Lotus said. "They have to make it easier, or they're going to get killed by Netscape [Communications Corp.] and Microsoft [Corp.]"

One Lotus customer, whose shop has heavy Notes and Domino experience, said he can understand why those without that expertise might look to alternatives for their initial foray onto the Web.

"You're effectively in a manual process for your HTML development in the Notes/Domino environment," said Phil

Gibson, director of InterActive Marketing at National Semiconductor Corp. in Santa Clara, Calif. "In most of the Web-based alternatives, you're starting to get into automated publishers where you do it in a WYSIWYG look and then slap it into HTML with a publishing push button."

Simplicity has become an industry watchword as vendors angle to provide the Web tools needed for building and deploying corporate intranets and extranets. Microsoft, for example, recently released its Office 60-Minute Intranet Kit, featuring a set of "ready-to-go intranet starter" templates for creating a departmental Web site.

Lotus officials last week declined to discuss Lotus' simplified Domino server.

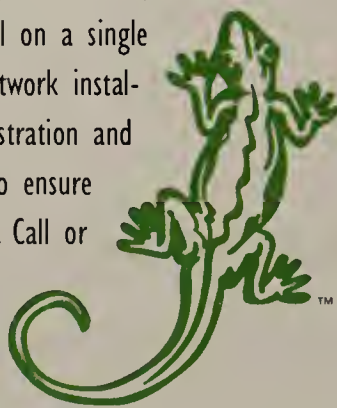
Domino.Action already includes templates that allow Webmasters to create a number of interactive site functions.

However, customizing Domino.Action "isn't a project for the fainthearted," according to Lotus' own Web site. "The multistep operation is complex and requires a fairly high level of Notes proficiency." The new package will be positioned on Lotus' lineup between an as-yet-unreleased offering called Lotus Go, a Web server designed for delivery of simple HTML pages, and full-fledged Domino, the company's flagship solution for conducting interactive business over the Internet.

© Lotus: (617) 577-8500

## CUT THE COST OF OWNERSHIP FOR PC TO UNIX CONNECTIVITY.

Our NEW Chameleon™ UNIXLink 97 delivers the most complete and cost-effective solution for PC-to-UNIX connectivity. NFS, X, 3270, 5250, and Telnet for all Windows platforms, all on a single CD. Plus customizable network installation, Web-based administration and online support wizards to ensure the lowest lifecycle costs. Call or visit our Website today. Download for yourself and see!



**NETMANAGE**  
Complete PC Connectivity Solutions

408.342.7530  
www.netmanage.com/unixlink97/

HIGH PERFORMANCE

©1997 NetManage Inc. All trademarks are properties of their respective owners. Chameleon and NetManage are trademarks or registered trademarks of NetManage.

CircleReaderService #19

## Netscape

Continued from page 8

Along with partners Sun, IBM and Oracle, Netscape announced that the Common Object Request Broker Architecture (CORBA) will be made to interoperate with the JavaBeans component model. The companies submitted a position paper to the Object Management Group, which has oversight of CORBA. Essentially, the firms hope to treat CORBA objects as JavaBeans, allowing them to be easily integrated into new 'Net-based dis-

tributed applications.

Netscape also committed to offering SuiteSpot server and Communicator client services, such as messaging, directory and database access, as JavaBeans. In time, all Netscape server and client applications will be collections of components with Bean interfaces, Schell said.

Netscape cofounder Marc Andreessen said a 100% pure Java version of Communicator would be released next year. Even blocks of code written in other languages can be packaged as a Bean, rather than using cumbersome CGI and the Netscape API, Schell said. ■



# Buy 3 . . . Get 1 **FREE**

Buy three of the new **DIGITAL** switching products mentioned below,  
between April 15 and August 31, 1997, and get a **FREE** Chassis or Stack Director!

## Special Offer Details:\*

Buy 3 VNswitch 900 modules and get a **FREE** MultiSwitch 900 Chassis (\$4090 value)

Buy 3 MultiSwitch 600 modules and get a **FREE** Stack Director module (\$495 value)

(\*Special offer available to end-users only, U.S., & Canada)

For more information on **DIGITAL** switching solutions, mail this card or call 1-800-457-8211 today.

☐ Please send me more information on these special offers and **DIGITAL** switching solutions.

☐ I would like to talk about improving my network performance. Please call me.

☐ Please send me information on the new 0% financing program on select switching products.

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Type of business \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone (     ) \_\_\_\_\_ Email \_\_\_\_\_

**digital**™

BFZ

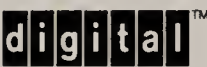




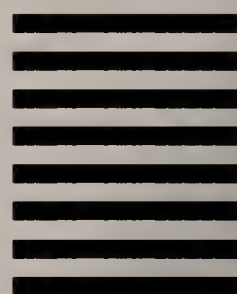
NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

**BUSINESS REPLY MAIL**  
FIRST-CLASS MAIL PERMIT NO 79 WESTFORD MA

POSTAGE WILL BE PAID BY ADDRESSEE



DIGITAL EQUIPMENT CORPORATION  
PO BOX 687  
WESTFORD MA 01886-9902





ATM

GIGABIT  
ETHERNET

IP  
SWITCHING

FDDI

ETHERNET &  
FAST  
ETHERNET

In networking, "and" is a vastly more powerful notion than "or." Which is why DIGITAL offers a comprehensive family

**We only build switches for the really important network technologies. Namely, all of them.**

of price/performance leading switches, for every technology.

You're into Ethernet and Fast Ethernet? DIGITAL has them.



*DIGITAL switches are equally at home in stand-alone, rack-mount or chassis configurations.*

Thinking ahead to Gigabit Ethernet? So is DIGITAL. Need secure, high-speed Internet access? We make the world's fastest FDDI and IP switches. Moving to ATM? DIGITAL's already there. Every DIGITAL switch is flexible, modular, scalable from desktop to enterprise. And backed by DIGITAL's worldwide service and support. See your

DIGITAL Business Partner, call 1-800-457-8211, or visit [www.networks.digital.com](http://www.networks.digital.com), for switches designed around the most powerful technology of all: the power of choice.

**digital**<sup>TM</sup>  
**Whatever it takes.**<sup>SM</sup>

©1997 Digital Equipment Corporation. DIGITAL and the DIGITAL logo are trademarks and Whatever it takes is a service mark of Digital Equipment Corp. All other products are trademarks or registered trademarks of their respective companies.

Circle Reader Service #3



Visit us at Booth 3454 at PC Expo, June 17-19th.

Printers so quick,  
they let your imagination run wild.

"Sometimes you  
have to look past  
the market leader to  
find an exceptional  
product that is also  
an exceptional value."



June 10, 1997  
Lexmark Optra S 1250  
Lexmark Optra S 1650



**Faster throughput on the most demanding jobs  
– introducing the Lexmark Optra S laser printers.**

Get ready for speed that really RIPs. Up to two times faster throughput than the leading competitor's comparably equipped 12, 16 and 24 ppm printers on your toughest, most complex jobs. It's a whole new animal in printers: the 1200 dpi Lexmark Optra™ S series.

Right out of the box, all major network environments are supported. And PCL® 6 and PostScript Level 2 emulations included at no

extra charge. You also get Lexmark's exclusive MarkVision™ Administrative software that lets you redirect jobs from busy printers and know when toner and paper are low – right from your PC. So you can avoid expensive downtime and reduce your total printing costs.

To learn more about how to keep your productivity out in front, call 1-800-LEXMARK or visit us at [www.lexmark.com](http://www.lexmark.com).

*A bold new breed of performance printers.*

**PRINT  
LEXMARK™**



# Local Networks

Covering: LAN hubs, switches, management • Operating systems • Servers

## Briefs

### ■ CMS Enhancements, Inc. last week released its Eclipse 16X CD-ROM Server

tower, which provides storage for large amounts of network data on homogeneous and mixed Intra-netWare, Windows NT and Unix LANs.

The unit is available in seven- and 14-bay versions that provide storage for as much as 9G bytes of CD-ROM information. Eclipse also offers as many as 14 8x CD changers for a total storage capacity of 30G bytes. All units ship with MediaAgent for CD software, which lets end users access data stored in the Eclipse tower simultaneously.

The tower is available now starting at \$4,958.

© CMS: (800) 327-5773

■ **Microsoft Corp.** has posted the final code for its Windows NT-based **LAN-to-LAN routing software** on its Web site ([www.microsoft.com](http://www.microsoft.com)). The Routing and Remote Access Service for NT Server 4.0, which was code-named Steelhead, is designed to turn NT Servers into low-end routers. The software supports the Routing Information Protocol, Dynamic Host Configuration Protocol and Service Advertisement Protocol. In addition, the routing product provides IP switching hooks.

■ **Gigabit Ethernet start-up Prominet Corp.** last week signed a multimillion-dollar reseller deal with **Net One Systems Company, Ltd.** of Tokyo.

Under terms of the agreement, Net One will sell, service and support Prominet's P550 Cajun Switch in Japan through the end of 1998. Prominet officials estimated that as many as 500 Gigabit Ethernet backbone switches will be sold via Net One during this period.



## 3Com offers choice of ATM or Gigabit Ethernet

By Jodi Cohen  
Santa Clara, Calif.

With its new autosensing 10M/100M bit/sec Ethernet switch, 3Com Corp. is not taking sides on the ATM vs. Gigabit Ethernet battle.

The internetwork vendor last week rolled out its first dual-

3Com may be a bit late to the party, with Bay Networks, Inc., Cisco Systems, Inc., Cabletron Systems, Inc. and NBase Communications already delivering switches that can autonegotiate between 10M and 100M bit/sec speeds in half- or full-duplex mode.

But only 3Com's new SuperStack II Switch 3000 10/100 device provides migration options to ATM and Gigabit Ethernet, analysts said.

"3Com is doing a really smart thing by telling customers that they can buy this SuperStack box now—even if they're running at just 10/100 speeds—and when they want to move to Gigabit Ethernet later, it's no problem," said John Armstrong, principal network analyst at Dataquest, Inc. in San

speed Ethernet stackable switch, which offers high-speed uplink modules for ATM or Gigabit Ethernet backbone connections.

Get more info online:

- Data sheets for mentioned switches
- Info on policy-based management
- Latest Gigabit Ethernet news

[www.nwffusion.com](http://www.nwffusion.com)



### 3COM'S AUTOSENSING 10/100 SWITCH WITH HIGH-SPEED UPLINKS

Product name	Description	Pricing	Availability
SuperStack II Switch 3000 10/100	12-port stackable switch	\$3,495	Now
SuperStack II Switch ATM module	One-port 155M bit/sec ATM uplink	\$3,995	August
SuperStack II Switch Gigabit Ethernet SX module	One-port 1G bit/sec Ethernet uplink	\$2,995	September

Jose, Calif. "I don't know of any other vendor that's offering that."

Armstrong said the box's biggest benefit is that "it's a safe buy" for customers not quite sure which high-speed LAN technology they will choose, but who will likely need to upgrade to ATM or Gigabit Ethernet in the future.

The 12-port SuperStack II Switch 3000 10/100 can provide Ethernet or Fast Ethernet links to desktops or aggregate 10M/100M bit/sec workgroup connections to 1G bit/sec switches at the network core. The devices can be stacked up to eight units high.

The switch builds on 3Com's family of stackables, including the 24-port Switch 1000 Ethernet switch and eight-port Switch 3000 TX 100M bit/sec Ethernet switch.

3Com's new switch supports more than 8,000 media access control addresses and provides broadcast traffic control, virtual LAN support and Remote Monitoring on every port.

In addition, the switch supports 3Com's TranscendWare software, which allows users to manage the device by defining policies, said Charles Gallagher, Fast Ethernet workgroup switch product-line manager at 3Com.

© 3Com: (408) 764-5000

## New release of SunSoft Solaris allows for gradual upgrades

By Christine Burns  
Menlo Park, Calif.

Sun Microsystems, Inc.'s SunSoft division last week announced a version of its Solaris operating system that the company said has better Web hooks and is more reliable, faster and easier to use than its predecessors.

Version 2.6—the most significant release of Solaris in three years—represents a change in how SunSoft delivers its Unix-based operating system, said Brian Croll, director of server software products. SunSoft has built Solaris 2.6 in a modular fashion so customers can roll out only the features they need, enabling them to avoid a full-blown upgrade, he said.

### A lighter load

The new architecture will save customers money by decreasing the amount of time it takes IS personnel to install the software and reducing the amount of system resources needed to run it,

said Bill Walker, chief technology officer at Smoke N' Mirrors, Inc., a large Sun reseller and systems integrator in Herndon, Va. "If I don't want any of the new features, I just don't load it, and I save all of that disk space and

memory for something that I will actually use," he said.

SunSoft, which is strongest in the enterprise server and technical desktop markets, is looking to work its way into the workgroup and Internet service provider markets with Solaris 2.6. To deliver what these markets need, Croll said SunSoft will ship the base functionality of Solaris 2.6 in August, then roll out specialized intranet, ISP, enterprise and power desktop packages.

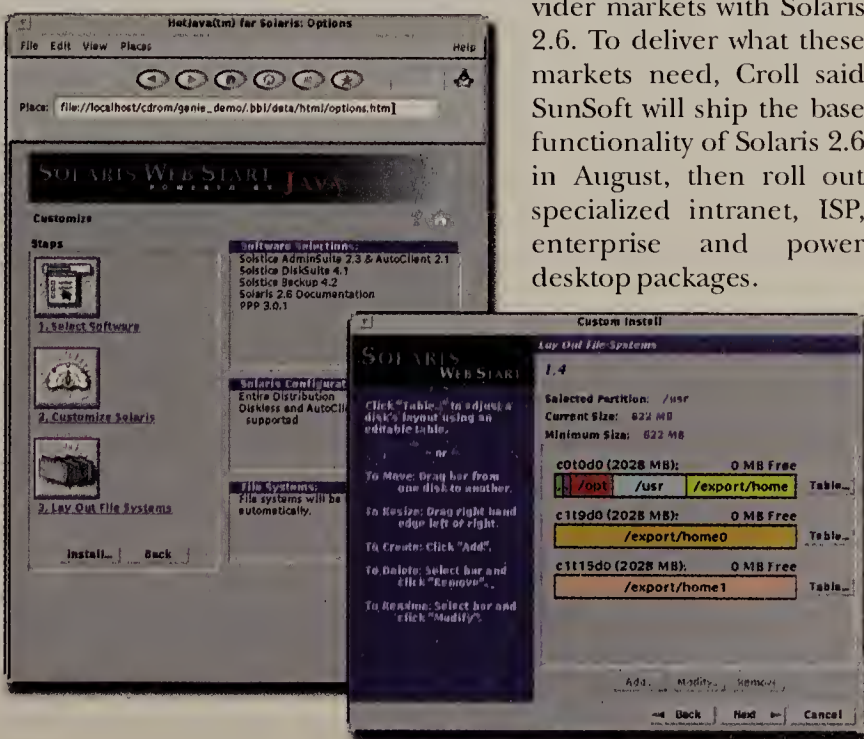
New Web features in Version 2.6 include a Java Virtual Machine, Just-In-Time-Compiler and Java APIs. Solaris 2.6 ships with an integrated version of Sun's WebServer, and all documentation is accessible via a standard Web browser.

The operating system will also feature an installation program called WebStart, which lets an administrator get the operating system up and running via a Web browser.

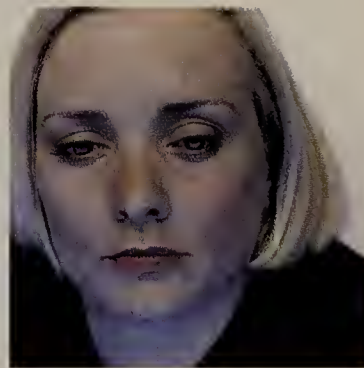
On the performance front, SunSoft enhanced the TCP/IP features, added support for ATM networks and beefed up the I/O performance for accessing large amounts of data from memory.

Solaris 2.6 can accommodate files of up to 1 terabyte and has improved 64-bit processor support. It also ships with NFS Fail-over and Sun's HA Clustering 1.3 software. Combined, these features provide continuous access to applications running on clustered Solaris machines.

© SunSoft: (800) 786-7638







**THERE WAS,  
IN FACT,  
A REASON  
THEY CALLED IT  
THE PERSONAL  
COMPUTER.**





Oh yeah. There's a person sitting in front of it.

Oftentimes, that person is a very special person called an employee. Someone who walks through your doors in the morning and back out in the evening (sometimes, very late in the evening). Someone who will rewrite paragraphs in the shower. Or not. Someone who will work through lunch to make something just right. Or not. Someone who will care. Or not.

It is people who define business. It is people who will determine whether your company will be just good or damn good or great. We believe that given the responsibility and the right tools, the people who work for you will do extraordinary things. For millions and millions of people, the right tool is the computer.

What makes the computer *personal* is a program called Microsoft® Windows®.

Windows makes computing easier, so more people can actually use a PC. It is intuitive and simple and familiar, and recognizable from computer to computer, person to person.

Windows makes computing more powerful. More than *one hundred thousand* programs have been written for the Windows platform. So you can type words and calculate numbers, create presentations with animation and sound and video, do 3-D CAD design, send a message to the other side of the office, send a message to the other side of the world, manage inventory and payroll, draw, find things on the Internet, create your own intranet, build a database, manage projects, hold live video meetings on screen and check your spelling.

And Windows makes computing travel. You can take your powerful programs, travel 3,000 miles, use them, plug your notebook computer into a phone jack and work as if you were sitting at your desk.

Windows makes the computer a tool your people can use. And it is, when all is said and done, your people who are going to make the difference.





## Desktop Beautification Project

In the late '60s, Lady Bird Johnson launched the Highway Beautification Project — an attempt to remove billboards and other unsightly views from the sides of the national highway system. Drive down your local interstate to deter-

mine for yourself how successful it was.

Now billboards are starting to show up on your end users' desktops. Rather than wait until the billboards are entrenched, maybe it's time to launch a Desktop Beautification Project.

Now I'm not talking about removing the truly ugly wallpaper or really vulgar screen saver your officemate might be using. I am referring to the "push" to add advertising to your desktop.

There's been a lot of talk about push technology that lets Internet sites send information to your computer through a software agent. Lately, the talk has been mostly about competing standards from Netscape Communications Corp. and Microsoft Corp. There's also Microsoft's Active Desktop technology, due in the next release of Windows 95 and already included in the freely available Internet Explorer 4.0 beta. Add to this various agents for pulling content over the Internet from companies such as PointCast, Inc. and CyberMedia, Inc.

While these technologies are not compatible, they do share two common attributes: They provide content you're interested in and advertising that pays for the service.

Consider PointCast. It delivers news, sports and weather headlines to your desktop around the clock. Whenever your machine is idle, it launches its own screen saver, showing you the latest information surrounded by advertising billboards.

Active Desktop goes a step further. It's rumored that the software will feature 10 to 12 predefined "channels" that tout Microsoft ventures such as the Expedia Travel Service and MSNBC. These channels will, by default, display right on the desktop.

Yes, the channels can be removed — as long as you visit every desktop or figure out desktop management according to Microsoft's Zero Administration Initiative. At least with PointCast, you have to actively install the agent, actively select the content and actively start it up.

The majority of network administrators dislike unsolicited, broadcast, e-mail advertising — otherwise known as spam. Yet the amount of spam is growing daily. Now Microsoft wants to bring you full-color and audio spam around the clock.

So far, I've seen no estimates of how much network bandwidth or resources this might consume. But it will be a factor.

Now is the time to let Microsoft know that you won't appreciate advertising on your network desktops. It would be nice if, by default, Active Desktop and its channels were disabled and required active intervention to turn them on.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at [wired@vquill.com](mailto:wired@vquill.com).



Dave Kearns

Why have over  
2,300 customers in  
50 countries chosen

**PMDF**

**e-Mail Interconnect**

from Innosoft for  
e-mail solutions ?

- ◆ **Complete solution product set** — enterprise backbones; multi-threaded SMTP, POP and IMAP mail servers; X.500 and LDAP; planning and implementation consulting; extended 24x7 support; **and much more!**
- ◆ **Internet standards-based** — maximum reach and interoperability
- ◆ **Reliability** — zero tolerance for lost messages
- ◆ **Scalability and flexibility** — tailored interconnectivity for small sites up through high volume support for hundreds of thousands of messages per day
- ◆ **Legacy integration** until you choose to change, and then bullet-proof support during each phase of migration
- ◆ **Superior value proposition** — you choose what cost / benefit profile matches your needs — ranging from customer installable software with technical support, through on-site consulting and customized extended support
- ◆ **World class mail system experts** who have "been there and done that" for over 10 years

After intensive hands-on testing by leading technical editors, PMDF has been recognized for product excellence



With interconnectivity for virtually every mail environment — Internet, X.400, PC LANs, and host-based systems. Call today for more information:

**1-800-552-5444**

[sales@innosoft.com](mailto:sales@innosoft.com)  
[www.innosoft.com](http://www.innosoft.com)

**innosoft  
international  
inc.**

PMDF and iii are registered trademarks of Innosoft International, Inc. • 1050 Lakes Drive, West Covina, CA 91790 • 1(626)919-3600

**Solaris**  
**Digital UNIX**  
**OpenVMS**

## HP, Intergraph extend NT server lines

By Christine Burns

Hewlett-Packard Co. and Intergraph Computer Systems have each altered their server lines to attack new segments of the Windows NT market.

HP is targeting data centers with a rack-mountable Pentium Pro processor-based server that supplements its line of stand-alone NT systems. Intergraph is entering the departmental market with two systems that boast feature sets similar to those found in the company's high-end NT models.

HP's new NetServer LXr Pro, announced last week, supports as many as four 200-MHz Pentium Pro processors, 512M bytes of error correcting and checking memory, and six PCI and four EISA slots. The unit has an Ultra SCSI controller and Ultra SCSI disk array controller.

As an option, the server can support HP's new NetServer Rack Storage/8 system, which supports as many as eight disk drives for as much as 72G bytes of storage.

NetServer LXr Pro is optimized for data centers in that customers can squeeze five of the servers into a standard rack while providing LAN managers with

front access to the servers' modular components.

Pricing for NetServer LXr Pro starts at \$24,000, and the base price for the NetServer Rack Storage/8 system is \$2,499.

Intergraph's new servers, the InterServer 650tx and 660tx, will be introduced this week and ship with NT 4.0. The units include most of the high-capacity and availability features of the high-end InterServer 650/660 models but cost \$4,000 to \$6,000 less, starting at about \$24,500.

The servers support as many as four 200-MHz Pentium Pro processors and have base memory configurations of 64M bytes. They include two 10Base-T Ethernet network slots, dual power supplies, Ultra-Wide 3 channel RAID controllers and three 4G-byte or three 9G-byte Ultra-Wide hot-pluggable hard drives. Both machines feature 10 PCI and 32 memory slots, allowing administrators to extend them to handle about 1 terabyte of storage and 4G bytes of memory capacity.

Intergraph will ship the InterServer 650tx and 660tx in July.

© HP: (800) 322-4772; Intergraph: (800) 763-0242



## Q: Where can you find the world's fastest CD-ROM Networking System?



**A: [www.procom.com/53X](http://www.procom.com/53X)**

Procom Technology, the leading name in CD-ROM networking solutions, is proud to introduce the fastest way to distribute gigabytes of CD-ROM based applications and data to networked users.

- Fast 53X performance
- 10ms access time
- Choice of 6-to 63-drive configurations
- Compatible with NetWare, NT, UNIX & OS/2
- Hot-swap drives, redundant power supplies & fans

Hyper CD is the newest in CD-ROM technology, accelerating CD-ROM access



through fast-burst reads to provide a data transfer rate of 7.9MB/sec and an average seek time of 10ms, more than four times faster than the fastest drives available today. So you get all the features of CD-ROM technology a durable, portable, interchangeable, low-cost medium at hard drive speed.

Join the growing number of government agencies, financial institutions, law firms and Fortune 500 companies who are already enjoying the benefits of networking CD-ROMs on Procom Technology's CD servers and arrays. Call us today at 800-800-8600 x414 or visit our website at [www.procom.com](http://www.procom.com).



**PROCOM TECHNOLOGY INC.**

2181 Dupont Drive Irvine, California 92612

Tel: 800.800.8600 • Tel: 714.852.1000 • Fax: 714.261.7380

<http://www.procom.com> • E Mail: [info@procom.com](mailto:info@procom.com)





# WHEN WORLDS CONVERGE, COMPANIES PARTNER.

With more and more networks, applications, and agent technologies entering today's enterprise, Tandem and Computer Associates have partnered to take control of this cross-platform environment by delivering the "best of breed" in enterprise management. This new "business-critical" level of control combines the superior heterogeneous, end-to-end management capabilities of CA's Unicenter TNG™ with Tandem's established reputation in reliable, scalable clustering technology. Visit us at [www.tandem.com](http://www.tandem.com) to learn more about this alliance. Or call 1-800-NONSTOP, ext. 8103 to receive our new brochure "Now Business-Critical Computing Is Manageable."



*Business-Critical Management*





# NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

☐ **Yes!** I want to receive/continue to receive my FREE subscription to *Network World*.

☐ No. Thank You.

Do you wish to receive Intranet Magazine FREE? (It will be a monthly publication with content similar to the Intranet supplement within *Network World*.) ☐ Yes ☐ No

Sign Here

Signature (required)

Date

To qualify: You must supply your company name and address. Please Print Clearly.

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Street address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Business phone (\_\_\_\_\_) \_\_\_\_\_ Business FAX (\_\_\_\_\_) \_\_\_\_\_

Internet e-mail address \_\_\_\_\_

If there is a parent company, please provide name: \_\_\_\_\_

If military, please specify branch and base: \_\_\_\_\_

If government, please specify division: \_\_\_\_\_

☐ My home address is also my business address.

**Optional delivery address:**

Enter your home address below if your company will not accept delivery at your business address:

Street address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

*Publisher reserves the right to serve only those individuals who meet publication qualifications.*

*ALL questions must be answered. Incomplete forms will not be processed.*

*Free subscriptions available to qualified US applicants. Foreign and Canadian rates available upon request.*

Form: 9702

## What is the principal business activity at your location? (check one only)

- |  |  |
|--|--|
| 01. <input type="checkbox"/> Manufacturing (other)   | 12. <input type="checkbox"/> Government (Federal/State/Local)                    |
| 02. <input type="checkbox"/> Finance/Banking   | 13. <input type="checkbox"/> Military  |
| 03. <input type="checkbox"/> Insurance/Real Estate/Legal   | 14. <input type="checkbox"/> Aerospace   |
| 04. <input type="checkbox"/> Health Care Services  | 15. <input type="checkbox"/> Consulting (Independent)*                           |
| 05. <input type="checkbox"/> Hospitality/Entertainment/Recreation  | 16. <input type="checkbox"/> Carriers/Interconnects                              |
| 06. <input type="checkbox"/> Media/TV/Cable/Radio/Print  | 17. <input type="checkbox"/> Internet Service Provider (ISP)                     |
| 07. <input type="checkbox"/> Retail/Wholesale Trade/Business Services  | 18. <input type="checkbox"/> Manufacturing (Computer/Communications/OEM)         |
| 08. <input type="checkbox"/> Transportation  | 19. <input type="checkbox"/> Resellers of Computer/Network Products (VARs, VADs) |
| 09. <input type="checkbox"/> Utilities   | 20. <input type="checkbox"/> Systems/Network Integrators*                        |
| 10. <input type="checkbox"/> Education   | 21. <input type="checkbox"/> Distributors (Computer/Communications)*             |
| 11. <input type="checkbox"/> Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry) | 22. <input type="checkbox"/> Other (please specify) _____                        |

\*Please complete form based on largest client.

## 2 What is your job function? (check one only)

### NETWORK IS MANAGEMENT:

- |  |   |
|--|---|
| 1. <input type="checkbox"/> Network Management                     | 6. <input type="checkbox"/> Engineering Management  |
| 2. <input type="checkbox"/> LAN Management                         | 7. <input type="checkbox"/> Corporate Management (CEO, Pres., VP, Dir., Mgr., Financial Management) |
| 3. <input type="checkbox"/> Datacom/Telecom Management             | 8. <input type="checkbox"/> Consultant (Independent)  |
| 4. <input type="checkbox"/> IS, IT, MIS, CIO, Systems Management   | 9. <input type="checkbox"/> Other (please specify) _____  |
| 5. <input type="checkbox"/> Internet/Intranet Management/Webmaster |   |

## 3 What is the estimated value of Network equipment and services that you specify, recommend or approve the purchase of? (Please print the appropriate number code in the box next to each product category. Please complete ALL categories A-M.)

- |                                   |   |  |
|-----------------------------------|---|--|
| 1. \$50 Million or more           | A <input type="checkbox"/> Large Systems (Mainframes/Minis)       | H <input type="checkbox"/> Internet        |
| 2. \$25 Million to \$49.9 Million | B <input type="checkbox"/> Desktops (Micros/Laptops/Workstations) | I <input type="checkbox"/> Intranet        |
| 3. \$10 to \$24.9 Million         | C <input type="checkbox"/> Servers                                | J <input type="checkbox"/> Remote Access   |
| 4. \$1 to \$9.9 Million           | D <input type="checkbox"/> LANs                                   | K <input type="checkbox"/> Peripherals     |
| 5. \$100,000 to \$999,999         | E <input type="checkbox"/> WAN Equipment                          | L <input type="checkbox"/> Software        |
| 6. \$50,000 to \$99,999           | F <input type="checkbox"/> Carrier Services                       | M <input type="checkbox"/> Service/Support |
| 7. Under \$50,000                 | G <input type="checkbox"/> Internetworking                        |  |
| 8. None of the above              |   |  |

## 4 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+    2. ☐ 50 - 99    3. ☐ 20 - 49    4. ☐ 10 - 19    5. ☐ 2 - 9    6. ☐ 1    7. ☐ None

## 5 What is the total number of Servers/Clients/LANs installed/planned at your location/in your entire organization? (Check one box in each column)

SERVERS		CLIENTS		LANs	
At Location	Entire Org.	At Location	Entire Org.	At Location	Entire Org.
A	B	C	D	E	F
<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>	<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>	<input type="checkbox"/> 1. 50,000+	<input type="checkbox"/>
<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>	<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>	<input type="checkbox"/> 2. 10,000 to 49,999	<input type="checkbox"/>
<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>	<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>	<input type="checkbox"/> 3. 1,000 to 9,999	<input type="checkbox"/>
<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>	<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>	<input type="checkbox"/> 4. 100 to 999	<input type="checkbox"/>
<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>	<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>	<input type="checkbox"/> 5. 50 to 99	<input type="checkbox"/>
<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>	<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>	<input type="checkbox"/> 6. 10 to 49	<input type="checkbox"/>
<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>	<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>	<input type="checkbox"/> 7. 1 to 9	<input type="checkbox"/>
<input type="checkbox"/> 8. none	<input type="checkbox"/>	<input type="checkbox"/> 8. none	<input type="checkbox"/>	<input type="checkbox"/> 8. none	<input type="checkbox"/>

## 6 What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

- |  |   |  |
|--|---|--|
| <b>A. Scope (check one only)</b>                 | <b>B. Involvement (check ALL that apply)</b>        |  |
| 1. <input type="checkbox"/> Corporate/Enterprise | 1. <input type="checkbox"/> Create Network Strategy | 4. <input type="checkbox"/> Evaluate           |
| 2. <input type="checkbox"/> Department           | 2. <input type="checkbox"/> Recommend/Specify       | 5. <input type="checkbox"/> Determine the need |
| 3. <input type="checkbox"/> None                 | 3. <input type="checkbox"/> Approve                 | 6. <input type="checkbox"/> None               |

## 7 What is the estimated number of employees at your location/in entire organization? (check one in each section)

- |   |   |
|---|---|
| <b>A. At your location:</b>                 | <b>B. Entire organization:</b>              |
| 1. <input type="checkbox"/> Over 20,000     | 1. <input type="checkbox"/> Over 20,000     |
| 2. <input type="checkbox"/> 10,000 - 19,999 | 2. <input type="checkbox"/> 10,000 - 19,999 |
| 3. <input type="checkbox"/> 5,000 - 9,999   | 3. <input type="checkbox"/> 5,000 - 9,999   |
| 4. <input type="checkbox"/> 2,500 - 4,999   | 4. <input type="checkbox"/> 2,500 - 4,999   |
| 5. <input type="checkbox"/> 1,000 - 2,499   | 5. <input type="checkbox"/> 1,000 - 2,499   |
| 6. <input type="checkbox"/> 500 - 999       | 6. <input type="checkbox"/> 500 - 999       |
| 7. <input type="checkbox"/> 499 or less     | 7. <input type="checkbox"/> 499 or less     |

8

Please indicate the products/services that you are currently involved in purchasing or plan to purchase: (Check ALL that apply)

A. Currently involved in purchasing

B. Plan to purchase

### INTERNET/INTRANET

- |  |   |
|--|---|
| A  | B   |
| <input type="checkbox"/> 01. <input type="checkbox"/> Internet Services                                | <input type="checkbox"/> 53. <input type="checkbox"/> Remote Access Products        |
| <input type="checkbox"/> 02. <input type="checkbox"/> Firewalls/Security/Encryption                    | <input type="checkbox"/> 54. <input type="checkbox"/> Remote Access Services        |
| <input type="checkbox"/> 03. <input type="checkbox"/> Internet Web Servers                             | <input type="checkbox"/> 55. <input type="checkbox"/> PDAs                          |
| <input type="checkbox"/> 04. <input type="checkbox"/> Intranet Web Servers                             | <input type="checkbox"/> 56. <input type="checkbox"/> PCMCIA Devices                |
| <input type="checkbox"/> 05. <input type="checkbox"/> TCP/IP Software                                  | <input type="checkbox"/> 57. <input type="checkbox"/> Wireless Data Services        |
| <input type="checkbox"/> 06. <input type="checkbox"/> Management/Monitoring Software                   | <input type="checkbox"/> 58. <input type="checkbox"/> Wireless Data Equipment       |
| <input type="checkbox"/> 07. <input type="checkbox"/> Push Technology                                  | <input type="checkbox"/> 59. <input type="checkbox"/> Cellular Equipment & Services |
| <input type="checkbox"/> 08. <input type="checkbox"/> Web Browsers                                     |   |
| <input type="checkbox"/> 09. <input type="checkbox"/> Intranet Applications/Groupware                  |   |
| <input type="checkbox"/> 10. <input type="checkbox"/> Search/Retrieval Products (web crawler)          |   |
| <input type="checkbox"/> 11. <input type="checkbox"/> Internet Development Tools (JAVA, ActiveX, etc.) |   |
| <input type="checkbox"/> 12. <input type="checkbox"/> Electronic Commerce Tools                        |   |
| <input type="checkbox"/> 13. <input type="checkbox"/> Internet Telephony                               |   |

### LOCAL-AREA NETWORKS

- |   |  |
|---|--|
| A   | B  |
| <input type="checkbox"/> 14. <input type="checkbox"/> Local-Area Networks               | <input type="checkbox"/> 60. <input type="checkbox"/> Network Management                       |
| <input type="checkbox"/> 15. <input type="checkbox"/> Network Operating System Software | <input type="checkbox"/> 61. <input type="checkbox"/> Systems Management                       |
| <input type="checkbox"/> 16. <input type="checkbox"/> Servers                           | <input type="checkbox"/> 62. <input type="checkbox"/> Security                                 |
| <input type="checkbox"/> 17. <input type="checkbox"/> Print Servers                     | <input type="checkbox"/> 63. <input type="checkbox"/> Communications Software                  |
| <input type="checkbox"/> 18. <input type="checkbox"/> ATM Switches                      | <input type="checkbox"/> 64. <input type="checkbox"/> Terminal Emulation                       |
| <input type="checkbox"/> 19. <input type="checkbox"/> Token-Ring Switches               | <input type="checkbox"/> 65. <input type="checkbox"/> Operating Systems                        |
| <input type="checkbox"/> 20. <input type="checkbox"/> Ethernet Switches                 | <input type="checkbox"/> 66. <input type="checkbox"/> Applications Development Tools           |
| <input type="checkbox"/> 21. <input type="checkbox"/> Fast Ethernet                     | <input type="checkbox"/> 67. <input type="checkbox"/> Database Management/RDBMS                |
| <input type="checkbox"/> 22. <input type="checkbox"/> Gigabit Ethernet                  | <input type="checkbox"/> 68. <input type="checkbox"/> Groupware                                |
| <input type="checkbox"/> 23. <input type="checkbox"/> IP Switches                       | <input type="checkbox"/> 69. <input type="checkbox"/> Workflow                                 |
| <input type="checkbox"/> 24. <input type="checkbox"/> LAN Storage/Backup                | <input type="checkbox"/> 70. <input type="checkbox"/> EDI                                      |
| <input type="checkbox"/> 25. <input type="checkbox"/> Optical LAN Storage/Backup        | <input type="checkbox"/> 71. <input type="checkbox"/> E-mail                                   |
| <input type="checkbox"/> 26. <input type="checkbox"/> Disk LAN Storage/Backup           | <input type="checkbox"/> 72. <input type="checkbox"/> Desktop Video Conferencing               |
| <input type="checkbox"/> 27. <input type="checkbox"/> Tape LAN Storage/Backup           | <input type="checkbox"/> 73. <input type="checkbox"/> Imaging                                  |
| <input type="checkbox"/> 28. <input type="checkbox"/> RAID LAN Storage/Backup           | <input type="checkbox"/> 74. <input type="checkbox"/> Suites/Server Suites (Back Office, etc.) |
| <input type="checkbox"/> 29. <input type="checkbox"/> Network Test/Diagnostic Tools     | <input type="checkbox"/> 75. <input type="checkbox"/> Middleware                               |
| <input type="checkbox"/> 30. <input type="checkbox"/> Cables, Connectors, Baluns        | <input type="checkbox"/> 76. <input type="checkbox"/> Document Management                      |
| <input type="checkbox"/> 31. <input type="checkbox"/> UPS                               | <input type="checkbox"/> 77. <input type="checkbox"/> Site Metering Tools                      |
| <input type="checkbox"/> 32. <input type="checkbox"/> Network Interface Cards           | <input type="checkbox"/> 78. <input type="checkbox"/> Computer Telephony Integration (CTI)     |
| <input type="checkbox"/> 33. <input type="checkbox"/> SNMP Network Management           | <input type="checkbox"/> 79. <input type="checkbox"/> Data Warehousing                         |

### INTERNETWORKING

- |   |  |
|---|--|
| A   | B  |
| <input type="checkbox"/> 34. <input type="checkbox"/> Routers                 | <input type="checkbox"/> 80. <input type="checkbox"/> Modems                             |
| <input type="checkbox"/> 35. <input type="checkbox"/> Hubs                    | <input type="checkbox"/> 81. <input type="checkbox"/> Asynchronous Transfer Mode (ATM)   |
| <input type="checkbox"/> 36. <input type="checkbox"/> Intelligent Hubs        | <input type="checkbox"/> 82. <input type="checkbox"/> Frame Relay Equipment/Services     |
| <input type="checkbox"/> 37. <input type="checkbox"/> Stackable Hubs          | <input type="checkbox"/> 83. <input type="checkbox"/> ISDN Equipment & Services          |
| <input type="checkbox"/> 38. <input type="checkbox"/> Bridge/Router           | <input type="checkbox"/> 84. <input type="checkbox"/> FT-1/T-1/T-3 Multiplexers/Services |
| <input type="checkbox"/> 39. <input type="checkbox"/> Bridges                 | <input type="checkbox"/> 85. <input type="checkbox"/> DSL Services/Products              |
| <input type="checkbox"/> 40. <input type="checkbox"/> Gateways                | <input type="checkbox"/> 86. <input type="checkbox"/> SONET                              |
| <input type="checkbox"/> 41. <input type="checkbox"/> Concentrators/Repeaters | <input type="checkbox"/> 87. <input type="checkbox"/> Inverse Multiplexers               |

### COMPUTERS/PERIPHERALS

- |  |  |
|--|--|
| A  | B  |
| <input type="checkbox"/> 42. <input type="checkbox"/> Network Computers                      | <input type="checkbox"/> 88. <input type="checkbox"/> SMDS                                     |
| <input type="checkbox"/> 43. <input type="checkbox"/> Laptops/Notebooks/Sub-Notebooks        | <input type="checkbox"/> 89. <input type="checkbox"/> Diagnostic/Test Equipment                |
| <input type="checkbox"/> 44. <input type="checkbox"/> Micros/PCs                             | <input type="checkbox"/> 90. <input type="checkbox"/> DSU/CSU                                  |
| <input type="checkbox"/> 45. <input type="checkbox"/> Minis                                  | <input type="checkbox"/> 91. <input type="checkbox"/> VSAT/Satellite                           |
| <input type="checkbox"/> 46. <input type="checkbox"/> Mainframes                             | <input type="checkbox"/> 92. <input type="checkbox"/> PBXs                                     |
| <input type="checkbox"/> 47. <input type="checkbox"/> Workstations                           | <input type="checkbox"/> 93. <input type="checkbox"/> Voice Mail/Response                      |
| <input type="checkbox"/> 48. <input type="checkbox"/> Printers/Network Printers              | <input type="checkbox"/> 94. <input type="checkbox"/> Videoconferencing                        |
| <input type="checkbox"/> 49. <input type="checkbox"/> CD-ROM                                 | <input type="checkbox"/> 95. <input type="checkbox"/> Leased Lines                             |
| <input type="checkbox"/> 50. <input type="checkbox"/> Fax/Modem Boards                       | <input type="checkbox"/> 96. <input type="checkbox"/> Switched Data                            |
| <input type="checkbox"/> 51. <input type="checkbox"/> Graphics/Multimedia/Audio/Video Boards | <input type="checkbox"/> 97. <input type="checkbox"/> Virtual Networks                         |
| <input type="checkbox"/> 52. <input type="checkbox"/> Memory/Chips/Boards/Cards              | <input type="checkbox"/> 98. <input type="checkbox"/> Outsourcing/Systems Integration Services |
|  | <input type="checkbox"/> 99. <input type="checkbox"/> Education/Training Services              |

☐ 00. ☐ None of the above (1 - 99)

9

Please indicate the platforms that are currently installed/planned:

(Check ALL that apply)

A. Currently installed

B. Planned for purchase

### NETWORK PROTOCOLS

- |  |  |
|--|--|
| A  | B  |
| <input type="checkbox"/> 01. <input type="checkbox"/> TCP/IP                       | <input type="checkbox"/> 25. <input type="checkbox"/> Windows NT                 |
| <input type="checkbox"/> 02. <input type="checkbox"/> IPv6                         | <input type="checkbox"/> 26. <input type="checkbox"/> Windows NT/Advanced Server |
| <input type="checkbox"/> 03. <input type="checkbox"/> SNA                          | <input type="checkbox"/> 27. <input type="checkbox"/> Novell IntranetWare        |
| <input type="checkbox"/> 04. <input type="checkbox"/> DECnet                       | <input type="checkbox"/> 28. <input type="checkbox"/> Novell (NetWare 4.X)       |
| <input type="checkbox"/> 05. <input type="checkbox"/> Novell IPX/SPX               | <input type="checkbox"/> 29. <input type="checkbox"/> Novell (NetWare 2.X, 3.X)  |
| <input type="checkbox"/> 06. <input type="checkbox"/> APPC/APPN/LU 6.2             | <input type="checkbox"/> 30. <input type="checkbox"/> Microsoft (LAN Manager)    |
| <input type="checkbox"/> 07. <input type="checkbox"/> NETBIOS                      | <input type="checkbox"/> 31. <input type="checkbox"/> LocalTalk (AppleTalk)      |
| <input type="checkbox"/> 08. <input type="checkbox"/> AppleTalk                    | <input type="checkbox"/> 32. <input type="checkbox"/> Banyan (VINES)             |
| <input type="checkbox"/> 09. <input type="checkbox"/> NFS                          | <input type="checkbox"/> 33. <input type="checkbox"/> IBM (LAN Server)           |
| <input type="checkbox"/> 10. <input type="checkbox"/> Other (please specify) _____ | <input type="checkbox"/> 34. <input type="checkbox"/> Artisoft (LANtastic)       |

### LAN ENVIRONMENT

- |  |  |
|--|--|
| A  | B  |
| <input type="checkbox"/> 11. <input type="checkbox"/> Gigabit Ethernet                     | <input type="checkbox"/> 35. <input type="checkbox"/> Other (please specify) _____ |
| <input type="checkbox"/> 12. <input type="checkbox"/> Switched Ethernet                    |  |
| <input type="checkbox"/> 13. <input type="checkbox"/> Fast Ethernet (100 Megabit Ethernet) |  |
| <input type="checkbox"/> 14. <input type="checkbox"/> Ethernet                             |  |
| <input type="checkbox"/> 15. <input type="checkbox"/> ATM                                  |  |
| <input type="checkbox"/> 16. <input type="checkbox"/> Token Ring/Token Ring Switching      |  |
| <input type="checkbox"/> 17. <input type="checkbox"/> IP Switching                         |  |
| <input type="checkbox"/> 18. <input type="checkbox"/> FDDI                                 |  |
| <input type="checkbox"/> 19. <input type="checkbox"/> 100Base-T                            |  |
| <input type="checkbox"/> 20. <input type="checkbox"/> 10Base-T                             |  |
| <input type="checkbox"/> 21. <input type="checkbox"/> LocalTalk                            |  |
| <input type="checkbox"/> 22. <input type="checkbox"/> Fibre Channel                        |  |
| <input type="checkbox"/> 23. <input type="checkbox"/> 100vg Any LAN                        |  |
| <input type="checkbox"/> 24. <input type="checkbox"/> Other (please specify) _____         |  |

### NETWORK OPERATING SYSTEM

- |  |   |
|--|---|
| A  | B |
| <input type="checkbox"/> 25. <input type="checkbox"/> Windows NT                   |   |
| <input type="checkbox"/> 26. <input type="checkbox"/> Windows NT/Advanced Server   |   |
| <input type="checkbox"/> 27. <input type="checkbox"/> Novell IntranetWare          |   |
| <input type="checkbox"/> 28. <input type="checkbox"/> Novell (NetWare 4.X)         |   |
| <input type="checkbox"/> 29. <input type="checkbox"/> Novell (NetWare 2.X, 3.X)    |   |
| <input type="checkbox"/> 30. <input type="checkbox"/> Microsoft (LAN Manager)      |   |
| <input type="checkbox"/> 31. <input type="checkbox"/> LocalTalk (AppleTalk)        |   |
| <input type="checkbox"/> 32. <input type="checkbox"/> Banyan (VINES)               |   |
| <input type="checkbox"/> 33. <input type="checkbox"/> IBM (LAN Server)             |   |
| <input type="checkbox"/> 34. <input type="checkbox"/> Artisoft (LANtastic)         |   |
| <input type="checkbox"/> 35. <input type="checkbox"/> Other (please specify) _____ |   |

### COMPUTER OPERATING SYSTEM

- |  |   |
|--|---|
| A  | B |
| <input type="checkbox"/> 36. <input type="checkbox"/> NT Server                    |   |
| <input type="checkbox"/> 37. <input type="checkbox"/> NT Workstation               |   |
| <input type="checkbox"/> 38. <input type="checkbox"/> Unix/Xenix/AIX               |   |
| <input type="checkbox"/> 39. <input type="checkbox"/> Solaris                      |   |
| <input type="checkbox"/> 40. <input type="checkbox"/> Windows                      |   |
| <input type="checkbox"/> 41. <input type="checkbox"/> Windows 95                   |   |
| <input type="checkbox"/> 42. <input type="checkbox"/> Windows 97                   |   |
| <input type="checkbox"/> 43. <input type="checkbox"/> DOS                          |   |
| <input type="checkbox"/> 44. <input type="checkbox"/> OS2/OS2 Warp                 |   |
| <input type="checkbox"/> 45. <input type="checkbox"/> IBM MVS/VM/VSE               |   |
| <input type="checkbox"/> 46. <input type="checkbox"/> Digital VMS                  |   |
| <input type="checkbox"/> 47. <input type="checkbox"/> Macintosh                    |   |
| <input type="checkbox"/> 48. <input type="checkbox"/> Other (please specify) _____ |   |

☐ 49. ☐ None of the above (1-48)

10

Which of the following Servers/Clients do you have installed/planned at your location? (check ALL that apply in each column)

- |                            | A. Servers               | B. Clients               |           | A. Servers               | B. Clients               |
|----------------------------|--------------------------|--------------------------|-----------|--------------------------|--------------------------|
| 01. Power PC               | <input type="checkbox"/> | <input type="checkbox"/> | 07. 486   | <input type="checkbox"/> | <input type="checkbox"/> |
| 02. Power Mac              | <input type="checkbox"/> | <input type="checkbox"/> | 08. 386   | <input type="checkbox"/> | <input type="checkbox"/> |
| 03. Mac Other              | <input type="checkbox"/> | <input type="checkbox"/> | 09. 286   | <input type="checkbox"/> | <input type="checkbox"/> |
| 04. Multiprocessor Servers | <input type="checkbox"/> | <input type="checkbox"/> | 10. Risc  | <input type="checkbox"/> | <input type="checkbox"/> |
| 05. P6/PII                 | <input type="checkbox"/> | <input type="checkbox"/> | 11. Alpha | <input type="checkbox"/> | <input type="checkbox"/> |
| 06. Pentium/Pentium Pro    | <input type="checkbox"/> | <input type="checkbox"/> | 12. Other | <input type="checkbox"/> | <input type="checkbox"/> |

11

Which of the following hardware platforms are installed/planned in your company? (check ALL that apply)

- | A - Mainframes (Large Scale)<br>Installed/Planned | B - Minis (Midrange)<br>Installed/Planned | C - Workstations<br>Installed/Planned        |
|---|---|--|
| 1. <input type="checkbox"/> IBM                   | 1. <input type="checkbox"/> IBM RS6000    | 1. <input type="checkbox"/> Sun Microsystems |
| 2. <input type="checkbox"/> Amdahl                | 2. <input type="checkbox"/> IBM AS400     | 2. <input type="checkbox"/> Silicon Graphics |
| 3. <input type="checkbox"/> Cray                  | 3. <input type="checkbox"/> Digital       | 3. <input type="checkbox"/> Digital          |
| 4. <input type="checkbox"/> Hitachi               | 4. <input type="checkbox"/> Tandem        | 4. <input type="checkbox"/> H-P              |
| 5. <input type="checkbox"/> Unisys                | 5. <input type="checkbox"/> Unisys        | 5. <input type="checkbox"/> IBM              |
| 6. <input type="checkbox"/> Other _____           | 6. <input type="checkbox"/> AT&T GIS      | 6. <input type="checkbox"/> Other _____      |
|   | 7. <input type="checkbox"/> H-P           |  |
|   | 8. <input type="checkbox"/> Data General  |  |
|   | 9. <input type="checkbox"/> Other _____   |  |



Please indicate the names and job functions of other individuals at your location to whom you would like us to send a copy of **NetworkWorld**.

Name _____	Job Function _____
Name _____	Job Function _____
Name _____	Job Function _____
Name _____	Job Function _____
Name _____	Job Function _____
Name _____	Job Function _____
Name _____	Job Function _____

Visit our Web Information Service, *Network World Fusion*<sup>™</sup>  
and apply on-line at <http://www.nwfusion.com>

1. FOLD HERE & MAIL TODAY



3. PLEASE TAPE HERE

2. FOLD HERE & MAIL TODAY



**BUSINESS REPLY MAIL**

FIRST-CLASS MAIL PERMIT NO 1752 NORTHBROOK IL

POSTAGE WILL BE PAID BY ADDRESSEE

**NetworkWorld**

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

PO BOX 3091

NORTHBROOK IL 60065-9928

NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES





# Internetworks

Covering: TCP/IP • SNA • Network Management • Muxes •  
Routers and WAN switches • Remote Access

## Briefs

■ **U.S. Robotics** has added software to its Courier I-Modem ISDN products that allows the products to host the company's **x2 56K bit/sec modem technology**. With the upgrade, remote office devices connected by a dial-up Basic Rate Interface ISDN line can be used as the digital end of a 56K bit/sec analog modem call. The x2 modems can achieve their fastest speeds only in one direction, and that must be away from a device connected by a digital link. The modems can also spoof carrier switches to set up voice ISDN calls, which cost less per minute in some areas.

© U.S. Robotics: (800) 877-2677.

■ **LANart Corp.** last week introduced LANart Inspector for HP OpenView for Windows. The product combines **SNMP capabilities** for LANart hubs and switches with the ability to **monitor other standards-based hubs and switches**. The software also allows users of LANart's Switch Companion Hub to remotely reassign stations to balance network traffic.

LANart Inspector for HP OpenView for Windows is available immediately at the suggested price of \$400 per unit.

© LANart: (800) 292-1994

■ **Cisco Systems, Inc.** last week said it will acquire privately held **Skystone Systems Corp.** of Ottawa for roughly \$89 million in cash and stocks.

Skystone develops a family of advanced fiber-optic network equipment, based on Synchronous Optical Network/Synchronous Digital Hierarchy (SONET/SDH) technology.

Under the terms of the acquisition, one million shares of Cisco common stock worth approximately \$66.5 million, along with \$22.6 million in cash, will be exchanged for all outstanding shares and options of Skystone.



## Software takes phone tag out of tech support

SupportAbility provides automated help desk data collection from Web browser.

By Jim Duffy  
Ann Arbor, Mich.

South Wind Design, Inc., a developer of help desk and technical support software, has developed a package the company claims can take the phone tag out of technical support.

SupportAbility software collects PC configuration information when users respond to hotlinked instructions on the SupportAbility Web site. SupportAbility runs on Microsoft Corp. Windows NT servers and Internet Explorer browsers.

By collecting this information before or during a help desk support call, the software can "significantly" reduce the 38 hours it typically takes to resolve network or system support problems, said Mark Place, vice president of marketing for

South Wind Design. SupportAbility enables help desk personnel to avoid asking users "20

"There's a lack of good communication between [users] and support providers," Place said.

SupportAbility provides an ActiveX Control on Internet Explorer that serves as a management agent, collecting information about the hardware and software configuration of the desktop PC. Once this information is collected, a trouble ticket and electronic report are automatically issued to help desk

personnel. The company claims that detailed questioning on system and software configuration

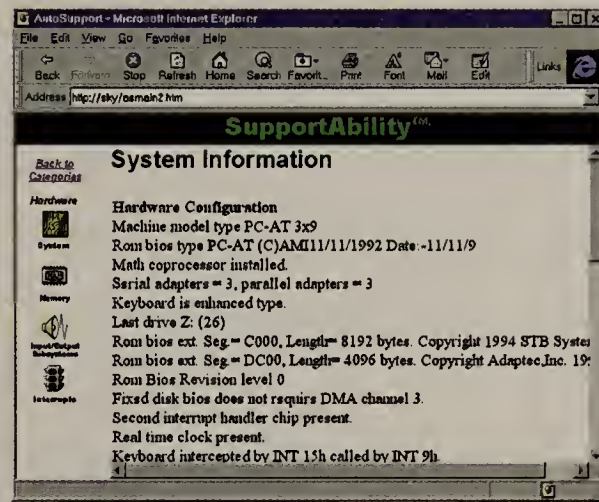
minutia is avoided.

"It allows the support provider to work on the basis of accurate information rather than simply what the user believes or perceives to be [the problem]," said Christopher Hoffman, research manager for software services at International Data Corp. in Framingham, Mass.

Hoffman said he is not aware of any other vendors addressing technical support in this fashion. Likewise, Place said SupportAbility has "no perceived competitors."

SupportAbility will be available later this month as a server-based application at \$5,995 per year or as a "pay-for-use" service hosted by South Wind for 79 cents per report.

© South Wind: (313) 213-0118



SupportAbility enables users to collect system configuration data automatically.

questions" about their system before they figure out how to solve the problem, Place said.

## Tunneling pack injects speed/cost trade-off

By Tim Greene  
Boulder, Colo.

Compatible Systems Corp. this week will announce a hardware and software package designed to reduce remote access costs.

The company's Intraport Tunnel Server lets remote Windows 95 users employ the Internet as a secure substitute for costly leased-WAN circuits when accessing the corporate backbone. The Intraport package consists of software for Windows 95 clients on TCP/IP or IPX-based remote LANs and a central site device that includes an Ethernet port. The central site device can support as many as eight remote users.

Once the software is deployed, data leaving the remote Windows 95 client is encapsulated in Compatible's Secure Tunneling Establishment Protocol (STEP) and sent over the Internet to the central site device. The central site device then unwraps the data and passes it on to its destination. STEP provides for IP and IPX encapsulation as well as digital signature authentication.

"This would save us a lot of money," said Emil Novelo, director of MIS for the National Audubon Society in New York, which is currently testing Compatible's products. With it, the society could eliminate some remote access leased lines.

Despite Intraport's potential benefits, Novelo found the pack-

over dedicated 56K bit/sec links now take 1 to 2 minutes. "Users just won't stand for that delay," Novelo said.

Tom Ferrell, marketing manager for Compatible, said the tunneling typically adds 5% to latency in the connection. Ferrell said the company was working with Audubon to isolate the cause of the problem in its network.

Despite that problem, Novelo said he likes the security tunneling offers. "There's not too many people who can break open an encrypted packet or would want to put the effort into it," he said.

Security is also what is attracting Kip Mullen, manager of network services for Washington Inventory Service in San Diego. Washington's remote users access their corporate e-mail over the Internet. But Mullen said the company will use the Internet for more sensitive applications if it becomes convinced the tunneling technology works.

### COMPATIBLE'S INTRAPORT TUNNEL SERVER

#### Product description:

- Hardware/software package for IP tunneling
- Tunneling through the Internet requires no support from Internet service provider
- Packet-by-packet authentication of remote user
- Costs \$2,995, which includes 10 client licenses



age adds a huge delay to remote users downloading files from the Audubon corporate network. The delay could be caused by injecting the Internet as the backbone transport, Novelo said, or it could be caused by encapsulating Audubon's traffic within STEP. He is planning tests to determine the cause.

Files that took 3 seconds to download using PPP sessions

NetworkWorld  
**Fusion**  
Get more info online, including overviews of various tunneling technologies.  
www.nwfusion.com

That would reduce the use of long-distance dial-up calls that are used for those more secure applications, he said.

Unlike rival tunneling technologies from Microsoft Corp. and Cisco Systems, Inc., Compatible's Intraport security operates at the Layer 3 routing layer of the ISO Open Systems Interconnection Reference model. That operation means Intraport checks each packet in a session for authentication to thwart hackers that somehow spoof their way past a Layer 2 Password Authentication Protocol/Challenge Handshake Authentication Protocol session. The Intraport authentication is based on the digital signature of the IP source.

Intraport is available for \$2,995; a Windows NT version is scheduled for later this summer.

© Compatible: (800) 356-0283



# Memotec speeds up frame relay access switch

*CX900e supports frame relay or ISDN WAN options, LAN and legacy traffic.*

By Tim Greene

Memotec Communications, Inc. last week introduced a faster version of its modular remote access switch that supports frame relay as well as dial-up wide-area links.

The new CX900e provides flexible WAN connectivity from remote offices, acting as a frame relay access device, analog modem or ISDN terminal adapter.

Sitting in a remote branch office, the CX900e outfitted with the appropriate cards can function as a bridge/router and funnel SNA and TCP/IP traffic from Ethernet and token-ring LANs onto a frame relay net.

The CX900e also supports local Synchronous Data Link Control spoofing to prevent SNA timeouts due to delays over the frame relay link.

Jim Helgesen, manager of software development for Shuffle Master, Inc. in Eden Prairie, Minn., said it was the CX900e's flexibility that drew him to use the product.

Shuffle Master is using the device to connect asynchronous terminals at gambling casinos in Louisiana to regional hubs where wagering data is analyzed. With plans to switch over the asynchronous traffic to LAN traffic, the company wanted a flexible remote access switch.

"All I'll have to do is unplug the asynchronous card and plug in an Ethernet card," Helgesen said.

He said his alternatives were few. While Helgesen could find other devices that could send his asynchronous traffic as frame relay, he found none that could be upgraded to support LAN traffic.

*"All I'll have to do is unplug the asynchronous card and plug in an Ethernet card," says Shuffle Master's Jim Helgesen.*

The CX900e also adds support for voice over frame relay, which Helgesen said could save Shuffle Master money on interoffice phone calls.

In addition to supporting different types of traffic, the CX900e also prioritizes it to ensure that time-sensitive traffic such as SNA goes through without timeouts.

## Setting priorities

The box supports four levels of prioritization: mission-critical, high-priority, normal and low-priority data. They can be set based on permanent virtual circuit, protocol and traffic type.

To enhance prioritization, the CX900e also fragments large LAN packets into smaller frames, ensuring priority traffic does not get stuck waiting for large frames to clear.

To save on the cost of wide-area links, the device also consolidates traffic from a remote site onto a single frame relay Data Link Connection Identifier.

The CX900e can also be configured to

back up failed frame relay circuits with either modem or ISDN dial up.

The chassis has six slots that hold one-port analog voice/fax, V.34 dial modem, Ethernet, token-ring, 56K/64K bit/sec DSU/CSU and Basic Rate Interface ISDN cards. A serial port card supports speeds up to T-1/E-1.

CX900e offers compression for SNA/SDLC, asynchronous, 3270 Binary Synchronous Communications, High-Level Data Link Control and X.25 traffic.



Memotec's CX900e offers remote access options.

Memotec plans to introduce two larger frame relay access switches by the end of the year. An ATM switch will be added next year.

Available in July, the CX900e costs \$1,995 to \$3,895, depending on configuration.

© Memotec: (514) 738-4781

## Ethernet Performance Been A Little

## Sluggish Lately?

**Come Out of Your Shell Fast...  
With Ethernet Switches, Hubs, and  
Adapters, from Osicom Technologies.**

To pep-up your 10BaseT Ethernet network, there's just no faster or easier way than installing Osicom's Fast Ethernet products. Our complete line of Fast Ethernet 10/100 switches, stackable hubs and adapter cards are specifically designed to provide maximum performance for small to mid-size networks and workgroups... without shelling out a lot of green.

Osicom's Ethernet and Fast Ethernet solutions are completely standards-based for total interoperability. Our modular design, auto-sensing and learning features provide optimum scalability and upgradeability. All with Osicom's proven technology, high reliability and



**Ethernet to Corporate LAN -->**



complete diagnostics to keep your network moving.

What's more, Osicom's Plug-and-Play products make installation and operation easy... without sticking your neck out. And, all Osicom Ethernet solutions are backed by a global service network and solid warranty that assures complete confidence in every networking investment... today and tomorrow.

No matter where you are, or where you're heading - Ethernet, Fast Ethernet, FDDI or Gigabit Ethernet - nobody provides better value, at a faster pace, than Osicom.

**For more information on Osicom's complete line of Fast Ethernet Hubs, 10/100 Switches and Adapters, call us toll-free at 1-888-OSICOM-8 (1-888-674-2668).**

 **Osicom**

INGRAM  
MICRO

Graybar

Tech Data

MicroAge

MERISEL

LOGOS  
COMMUNICATIONS, INC.

INTERNATIONAL

Osicom Technologies, Inc. • 888-OSICOM-8 or 301-317-7527 • info@osicom.com • http://www.osicom.com

Circle Reader Service #5

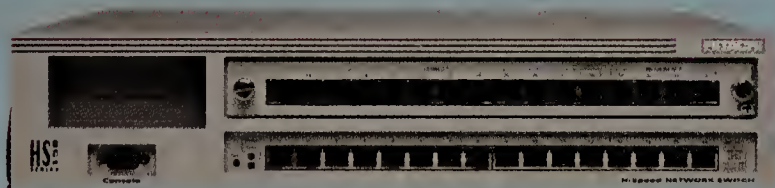




# GIVE YOUR NETWORK A QUADRUPLE BYPASS.

THE HiSpeed™ 150-10 SWITCH. FOUR OR EIGHT 10/100 PORTS.

LANs everywhere are suffering the strain of network congestion. A problem solved easily by the 16-32 port HiSpeed™ 150-10. With four or eight 10/100 ports, you've got the easy migration to Fast Ethernet that server farms and bandwidth-hungry applications need. And as



you more speed and flexibility. And your network a new lease on life. **HITACHI** Internetworking

the only switch of its kind with uplinks to ATM, FDDI, ISDN and Frame Relay, you have more connectivity options. All in all giving **HITACHI** Internetworking

©1997 Hitachi Computer Products (America), Inc., All rights reserved. HI, HiSpeed, HiView and Hitachi Internetworking are trademarks of Hitachi Computer Products (America), Inc. All other brand or product names are trademarks of their respective holders.

For our booklet "Integrated LAN/WAN Switching for High Speed Internet Access" call 1-888-48HiSpeed or visit our Web site at [www.internetworking.hitachi.com](http://www.internetworking.hitachi.com)



# GROWTH HAPPENS.





# MANAGE IT.

## NEW DELL POWEREDGE 2200 SERVER

233MHz PENTIUM® II PROCESSOR  
Dual Processor Capable, RAID Capable

- 32MB ECC EDO Memory (512MB Max.)
- 512KB L2 Cache
- Integrated PCI Ultra-Wide SCSI-3 Controller
- 2GB Ultra-Wide SCSI-3 Hard Drive [7200 RPM, 8ms] (27GB Max.)
- 8X SCSI CD-ROM Drive
- Intel® EtherExpress™ Pro/100 NIC
- Intel LANDesk® Server Manager v2.5x
- NEW Dell Server Assistant CD-ROM
- 6 Expansion Slots: 3 PCI, 3 EISA
- 6 Drive Bays: 3 External 5.25" / 3 Internal 3.5"
- 3 Year Limited Warranty\*
- ★ MS® Windows NT® Server 4.0, add \$799.
- ★ 800HS Trinitron® Monitor (13.7" v.i.s.), add \$399.

## \$3249

Business Lease\*: \$119/Mo.  
Order Code #250070

## NEW DELL POWEREDGE 2200 SERVER

266MHz PENTIUM II PROCESSOR  
Dual Processor Capable, RAID Capable

- 96MB ECC EDO Memory (512MB Max.)
- 512KB L2 Cache
- Integrated PCI Ultra-Wide SCSI-3 Controller
- 4GB Ultra-Wide SCSI-3 Hard Drive [7200 RPM, 8ms] (27GB Max.)
- 8X SCSI CD-ROM Drive
- Intel EtherExpress Pro/100 NIC
- MS Windows NT Server 4.0
- Intel LANDesk Server Manager v2.5x
- NEW Dell Server Assistant CD-ROM
- 6 Expansion Slots: 3 PCI, 3 EISA
- 6 Drive Bays: 3 External 5.25" / 3 Internal 3.5"
- 3 Year Limited Warranty
- ★ Upgrade to a 9GB Ultra-Wide SCSI-3 Hard Drive, add \$450.

## \$4999

Business Lease: \$179/Mo.  
Order Code #250072

## NEW DELL POWEREDGE 2200 SERVER DUAL 266MHz PENTIUM II PROCESSORS

- RAID Level 5 Configuration
- 32MB ECC EDO Memory (512MB Max.)
- 512KB L2 Cache
- PowerEdge Expandable RAID Controller with 4MB Cache
- Integrated PCI Ultra-Wide SCSI-3 Controller
- Three 2GB Ultra-Wide SCSI-3 Hard Drives [7200RPM, 8ms] (27GB Max.)
- 8X SCSI CD-ROM Drive
- Intel EtherExpress Pro/100 NIC
- Intel LANDesk Server Manager v2.5x
- NEW Dell Server Assistant CD-ROM
- 6 Expansion Slots: 3 PCI, 3 EISA
- 6 Drive Bays: 3 External 5.25" / 3 Internal 3.5"
- 3 Year Limited Warranty
- ★ Upgrade to 64MB ECC EDO Memory, add \$239.

## \$6899

Business Lease: \$248/Mo.  
Order Code #250073

## DELL POWEREDGE 4100 SERVER

200MHz PENTIUM® PRO PROCESSOR  
Mid-Range Server with Redundancy

- 128MB ECC EDO Memory (1GB Max.)
- 512KB Integrated L2 Cache
- Two Integrated PCI Ultra SCSI-3 Controllers
- 9GB Ultra-Wide SCSI-3 Hard Drive [7200 RPM, 8ms] (54GB Max.)
- 8X SCSI CD-ROM Drive
- Intel EtherExpress Pro/100 NIC
- MS Windows NT Server 4.0
- Intel LANDesk Server Manager v2.5x
- NEW Dell Server Assistant CD-ROM
- 8 Expansion Slots: 5 PCI, 3 EISA
- 10 Drive Bays: 4 External 5.25" / 6 Hot Plug
- DirectLine™ Network OS Support
- 3 Year Limited Warranty
- ★ Add a 2nd 9GB Ultra-Wide SCSI-3 Hard Drive, add \$1499.

NOT PICTURED

## \$7599

Business Lease: \$272/Mo.  
Order Code #200212

## THE NEW DELL POWEREDGE 2200 SERVER. EXPANDABILITY FOR YOUR GROWING BUSINESS

Just because growth is unpredictable doesn't mean it has to be unmanageable. Especially since the *NEW* Dell PowerEdge 2200, the feature-optimized server with the perfect mix of performance and expandability, can be yours for one of the best prices in the industry. Advanced technology like the Pentium II® processor, dual processing capability, and an optional RAID feature enable this server to deliver outstanding performance. And if your business is looking to really maximize its network uptime, the Dell PowerEdge 4100, with its redundant hot plug hard disk drives, high-speed fans, and optional redundant hot plug power supplies, offers incredible data security. So call Dell today and we'll start building a PowerEdge server for your growing business immediately. Since it's never too early to get a jump on the competition.

# DELL®

TO ORDER TOLL-FREE

## 800-283-1510

TO ORDER ONLINE

[www.dell.com/buydell](http://www.dell.com/buydell)

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT  
Sun 12pm-5pm CT In Canada, call 800-839-0148  
GSA Contract #GS-35F-4076D

Keycode #29045

†For a complete copy of our Guarantees or Limited Warranties, please write Dell USA L.P., One Dell Way, Box 12, Round Rock, TX 78682. †Leasing arranged by third-party leasing companies to qualified companies. †On-site service is provided by an independent third-party provider and may not be available in certain remote areas. ★Prices and specifications valid in the U.S. only and subject to change without notice. Intel, the Intel Inside Logo, Pentium and LANDesk are registered trademarks and EtherExpress, the Pentium Processor logo and the Pentium Pro Processor logo are trademarks of Intel Corporation. MS Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation. 3Com is a registered trademark of 3Com Corporation. DirectLine is a service mark of Dell Computer Corporation. Trinitron is a registered trademark of Sony Corporation. ©1997 Dell Computer Corporation. All rights reserved.





A B C D E F  
G H I J K  
L M N O  
P Q R S T U  
V W X Y Z

Sometimes the  
quickest way  
from A to Z  
is to start  
in the middle.



*Magstar MP, with its unique midpoint loading and exceptional reliability, retrieves most data up to three times faster than comparable systems.*

The Magstar™ MP storage system starts in the middle of the tape, instead of the beginning, so you can retrieve most data up to three times faster than comparable tape storage systems\*. (Such a simple idea, our competitors wonder why they didn't think of it first.) Which means tape isn't just for backup

anymore. With Magstar MP's remarkable three-year warranty, and prices starting as low as \$8,500, you can confidently use tape for all your storage needs. Contact your IBM representative or IBM Business Partner™, or visit [www.storage.ibm.com](http://www.storage.ibm.com) for more information and a copy of our warranty.

Solutions for a small planet™



\*For most single file restores. Based on "Demystifying Tape Performance," a comparison with two leading midrange systems, available at [www.sresearch.com](http://www.sresearch.com). IBM is a registered trademark and Magstar, Business Partner and Solutions for a small planet are trademarks of IBM Corporation in the United States and/or other countries. © 1997 IBM Corp.



# Carriers & ISPs

**Covering:** The Internet, Interexchange and Local Carriers

• Wireless • Regulatory Affairs • Voice Equipment

## Briefs

■ **The Federal Communications Commission** has proposed **allowing foreign carriers to buy 100% of U.S. carriers**, if the foreign carrier is from one of the 69 countries that signed the recent World Trade Organization agreement.

If approved, the new rule would reverse the FCC's 1995 policy requiring foreign buyers to show that their home markets offer roughly equivalent competitive opportunities to U.S.-based carriers.

British Telecommunications plc's purchase of MCI Communications Corp. is expected to pass muster either way, but the new rule could pave the way for other foreign carriers such as France Telecom and Deutsche Telekom to raise their stakes in Sprint Corp. and smaller carriers.

■ **Your local voice, video and data traffic may soon travel over wireless loops.** Last week, **Inter-Digital Communications Corp.**, of King of Prussia, Pa., demonstrated its **Broadband**

**Asia**  
**TELECOM**

**Code Division Multiple Access Wireless Local Loop (B-CDMA WLL)**

system at the Asia Telecom 97 International Telecommunication Union trade show in Singapore.

B-CDMA WLL is being developed by InterDigital, Samsung and Siemens to offer land-line voice quality at ISDN speeds — 56K to 128K bit/sec — over wireless networks. Field trials are expected to begin later this year.

■ **Comcast Corp.**, of Philadelphia, is getting a **\$1 billion boost from Microsoft Corp.**

The investment will be used to push high-speed data and video services out to business and residential users over Comcast's cable network.

Microsoft Chairman Bill Gates is expected to work closely with Brian Roberts, president of Comcast, in developing technical strategies for the cable television company.

## Management Tools

# Nortel tools monitor frame, ATM nets

By David Rohde  
New Orleans

Northern Telecom, Inc. is offering a new twist on a growing trend: enabling users to monitor carriers' frame relay and ATM network performance.

At the recent SuperComm '97 show here, Nortel introduced two network management tools called the Magellan ServiceMonitor and Service Management Reporter. Designed to be installed at user sites by carriers that offer managed fast-packet services, the two software packages give users a peek at the traffic passing through their carrier's Magellan Passport switches.

The goal is to enable users to see if the carrier is meeting agreed-upon performance standards incorporated into service-

level agreements, according to Nortel officials. Such performance standards include the percentage of dropped frames in

### Other ways to do it

Nortel joins several carriers and independent software vendors that have already delivered frame relay performance measurement tools.

Carrier or vendor	Name of product	Comment
Concord Communications	Network Health-Frame Relay	Graphical reports available through Ameritech and MCI
Intermedia Communications	ViewSPAN	Monitors traffic passing through Cascade carrier switches
Visual Networks	Visual UpTime	Prime performance measurement tool for Sprint users
WorldCom	Web Network Management System	Hourly and daily statistics via browser interface

## GeoTel cashes in on advanced call routing

Call centers turn to company's NT application for support across multiple ACDs.

By David Rohde  
Littleton, Mass.

The proprietary nature of big telephone switches is proving to be a boon for one software vendor that coordinates call routing among multiple call centers using ordinarily incompatible systems.

GeoTel Communications Corp.'s Intelligent CallRouter, a high-end Windows NT Server application, is gaining favor among administrators of distributed inbound call centers. Since the beginning of this year, GeoTel has sold the product to companies such as American Airlines, Inc., American Express Co., Citicorp and Land's End.

In a corporate call center network, Intelligent CallRouter acts as a highly customized equivalent of a carrier's Signal Control Point (SCP) call-routing database. Usually, a carrier set to deliver an 800 or 888 call to a user with multiple call centers consults its SCP to see what instructions the user has left in advance to route the call, based on time of day, agent skills and other factors. In contrast, the Intelligent CallRouter takes continuous feeds over WAN links

from each of the user's automatic call distributors (ACD), updating the status of each agent in the country or even overseas.

The carrier consults the CallRouter server for each toll-free

system works even if the corporate call center net uses ordinarily incompatible ACDs (see graphic).

Long-distance carriers have offered variants on this idea, but their typically Unix-based routing software only responded to routing queries from that particular carrier. By contrast, GeoTel's NT-based system performs the same function for the three biggest long-distance carriers.

Because users can switch 800 carriers without losing their 800 numbers, a call-routing system that works the same way with different carriers appeals to those seeking to keep AT&T, MCI Communications Corp. and Sprint Corp. alert. "We allow the customers to have a little leverage over the carriers," said Lou Volpe, GeoTel's vice president of sales and marketing.

Such advanced call routing comes at a steep price. A typical three-site installation costs \$500,000 to \$600,000, according to Volpe. For each carrier the user employs, the customer must also purchase dedicated links into the carrier's advance Signaling System 7 network.

© GeoTel: (508) 486-1100

### MULTIVENDOR SUPPORT

GeoTel's Intelligent CallRouter software supports toll-free services and automatic call distributors (ACD) from the following carriers and vendors:

#### Toll-free services

- ▶ AT&T
- ▶ BT
- ▶ MCI
- ▶ Sprint

#### ACDs

- ▶ Aspect
- ▶ Lucent
- ▶ Nortel
- ▶ Rockwell
- ▶ Siemens

call to decide where to route the call based on real-time agent status, thus limiting the risk of overstaffing. Because GeoTel has built interfaces with each of the top five ACD manufacturers, the

frame relay and the maintenance of various ATM quality-of-service standards.

Both ServiceMonitor and Service Management Reporter are Hewlett-Packard Co. OpenView net management-based applications that reside on the customer premises. ServiceMonitor provides a real-time status check of traffic levels, and Service Management Reporter provides network usage and performance reports over specified time periods, such as a week or a month.

Because the carrier installs the tools at the user's site, the carrier is responsible for paying Nortel for the software. Some carriers are planning to turn around and charge users separately for the capability, said Mark Tharby, Nortel's manager of enterprise marketing for Magellan networks. Other carriers intend to incorporate the charge into their monthly managed services prices, he said.

Tharby conceded a limitation of Nortel's new products compared with other carrier network management offerings: They only work if the carrier has standardized its frame relay or ATM service on Magellan switches.

This limitation is likely to give initial implementations of Magellan ServiceMonitor and Service Management Reporter an international spin. The most prominent carriers that have standardized on Magellan include Cable & Wireless plc Mercury Communications unit in

**NetworkWorld Fusion**

Get more info online: **2415**

- A look at frame relay management applications from Sync Research and NetScout
- An overview of the difficulties users face in monitoring their carriers' frame relay performance

[www.nwtfusion.com](http://www.nwtfusion.com)

the U.K., the Pan-European consortium AT&T Unisource and the global value-added network Equant, an outgrowth of the long-standing SITA airline data network.

See Nortel, page 32



WAN MONITOR

# When mergers do you no good at all

**S**o many people these days talk about mergers as if they are something new. But did you know that MCI bought 27 companies before it was invested in by British Telecommunications plc? WilTel also has quite the merger history. The company was put together with pieces of the old National Telecommunications Network. Now WilTel is a piece of the LDDS/Metromedia/WorldCom/ATC pie.

Everyone wants to maintain growth, and mergers have long been a way to do this simply. But by the time anyone actually gets around to delivering on the benefits of the merger, another company has been added to the pie, mucking it up some more. In the end, mergers stall innovation and progress, they don't add to them.

Equipment vendors are better at creating change than the service providers —

take, for example, the StrataCom/Cisco combo. It's probably related to being able to shift engineers from one project to another, and equipment being more clear-cut in its product definition than services. Meanwhile, carriers promise the world and deliver practically nothing.

So it's hard to get excited when you hear about an SBC Communications/AT&T merger, or a Cable & Wireless/AT&T link or anything of that ilk. It takes so long to get anything solid out of the relationship — anything you can buy, lease or use — it almost isn't worth noting.

Let's face it — how long do you think it would take to really get something like a one-stop-shop service/bill/customer service/network management from a combined SBC/AT&T? AT&T can't even do this on its own. We're tired of carriers thinking that a single 800 number and

unified brand mean anything anymore — they are not the same as a single place to shop.

Take a look at almost any merger, and you can see that the new company doesn't really get its act together until years after the deal actually closes. Holding your breath for a major, single-region service plan from NYNEX and Bell Atlantic? We've got news for you — most of the groups that pull off such a merger have not even been able to talk together in a lot of detail.

In the meantime, most initiatives actually get put on hold. For instance, NYNEX's request for proposal for asymmetric digital subscriber line got shelved this month until the merger is complete to see whether it makes sense to use Bell Atlantic's strategy, proceed with their prior plans or do something in between.

So when you hear about the potential of SBC and AT&T getting together, don't get too worked up. The SBC/AT&T combo won't take off with some minor regulatory handcuffs. Instead, it will be laden with Houdini-style manacles, chains and a big telephone booth filled with water.

And even if they could escape those regulatory constraints, they still have to complete the merger. And history shows

that takes a long, long time.

*Briere is president and Heckart is director of broadband with TeleChoice, Inc., a consultancy in Verona, N.J. They can be reached at [dbriere@telechoice.com](mailto:dbriere@telechoice.com) and [heckart@telechoice.com](mailto:heckart@telechoice.com).*



**Daniel Briere  
and Christine Heckart**

## Nortel

*Continued from page 31*

Still, carriers that install Magellan switches may find that Nortel's management scheme is more efficient than offering users a third-party vendor's network monitoring tool, Tharby said.

Each Passport switch in a carrier's network has a local storage capability that allows it to retain performance data for a period of time, then upload it to the main network operations center on a set schedule, he explained. That eliminates the need for continuous polling by the network management module at the main site.

Future targets for Nortel's management packages are likely to include Sprint Corp. and MCI Communications Corp., both of which recently began offering third-party frame relay monitoring tools as a service option. ■

REMOTE CONTROL  
SOFTWARE THAT  
FLIES  
ANY PC.



*NetOp software is the universal remote for PCs. It lets you view and control networked or remote PCs from anywhere, on any platform. And, you won't have to worry about crashing it into your neighbor's house.*

WIN 95 WIN NT WIN 3.X OS/2 DOS

- **Cross-platform**  
All major operating systems.
- **Unsurpassed security features**  
Access Control Server and Transaction Logging.

- **Powerful remote control features**  
No more running around to provide tech support.
- **Simultaneous control**  
Control multiple PCs.

- **Available in multiple quantities**  
From single to an infinite number of users.

**Stop wasting time & money!**

**Try it now FREE**  
800.675.0729

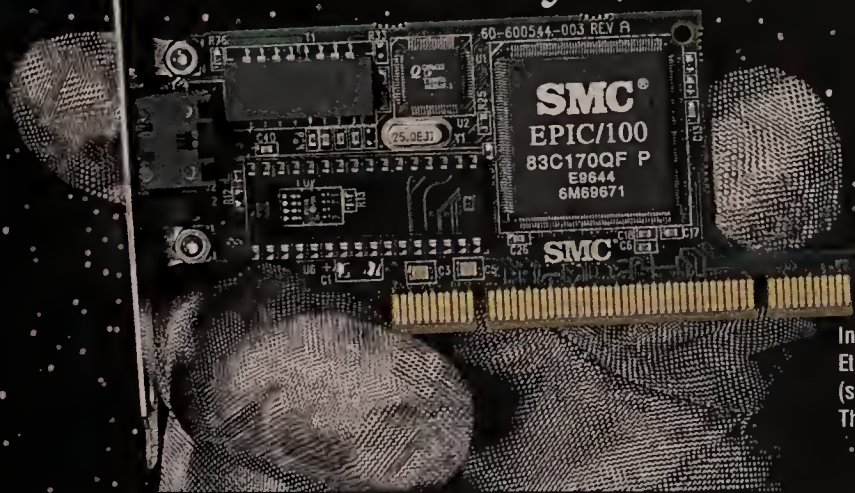
Visit our Web site at  
[WWW.4CTC.COM](http://WWW.4CTC.COM)

**NetOp**

NetOp is available from CrossTec Corporation.



Fast Ethernet will save you time.  
SMC will save you money.



Introducing the new  
EtherPower™ II 10/100  
(shown at 75% actual size).  
The fastest in the galaxy.

Save up to **40%** on 100 Mbps solutions with Stellar Values.  
See reverse for details.

Limited-time offer—  
for details visit: **[www.stellarvalues.smc.com](http://www.stellarvalues.smc.com)**

**SMC**  
Connect With Us.



# 100BASE-T minus 40%. And counting.

Save up to 40% on Fast Ethernet solutions from SMC.

Contact SMC today about Stellar Values\*—our special pricing offers on the EtherPower™ II 10/100 card, EZ Hub™ 100, TigerSwitch™ 100, and TigerStack™ 100. Available from 4/1/97 to 6/30/97, this offer is limited to 5 EtherPower II 10/100 cards, 1 TigerSwitch 100, 1 EZ Hub 100, 2 TigerStack 100 hubs, 1 TigerStack 100 NMU, and 1 TigerStack 100 ISM per qualified customer, while supplies last. For more information, visit [www.stellarvalues.smc.com](http://www.stellarvalues.smc.com), or complete this response card and fax to 630-916-6304. Or call 1-800-SMC-4-YOU, Dept. SV06.

Please contact me immediately to tell me how I can implement Fast Ethernet and save big bucks at the same time.

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ Zip \_\_\_\_\_ Phone \_\_\_\_\_  
Fax \_\_\_\_\_ E-mail \_\_\_\_\_



**EZ Hub 100**  
(SMC5208TX)



**TigerStack 100**  
(SMC5312TX, SMC5324TX,  
SMC5300-NMU, SMC5300-STX4)



**TigerSwitch 100**  
(SMC6608T)



**EtherPower II 10/100 Card**  
(SMC9432TX)

\* Program is subject to additional terms and conditions, is valid in the US only, and is available only to prospects qualified by SMC in its sole discretion. Program is subject to change or cancellation by SMC without notice. Limited supply only. Not available to resellers, distributors or Federal agencies.



SMC's new  
Fast Ethernet cards  
are the fastest  
in the galaxy.



Especially  
when connected  
to the  
mother ship.



TigerStack 100

### Fast Ethernet solutions from SMC.

EtherPower II  
10/100  
as low as  
**\$78**

When you're launching a Fast Ethernet initiative, it pays to buy the best

entry vehicle.

And according to an independent study\*, SMC's new EtherPower™ II 10/100 network card offers the industry's best price/performance. With top throughput. Unsurpassed CPU utilization. 10/100 Auto-Negotiation. The easiest installation. For as little as \$78—the lowest suggested retail price you'll find today.

Add our SwitchReady™

TigerStack™ 100 hubs to offer a complete Fast Ethernet workgroup solution including advanced management, the ability to create multiple segments within a stack, plus 10/100 Mbps switching and seamless integration at a breakthrough price.

And the entire solution is backed by the industry's strongest Customer Satisfaction Guarantee.

The SMC Fast Ethernet workgroup solution. That's one giant leap for your network. One very easy step for you.



**SMC**<sup>®</sup>  
Connect With Us.

**Special pricing available on select Fast Ethernet products.\*\* This is a limited-time offer, so sign up today at [www.stellarvalues.smc.com](http://www.stellarvalues.smc.com). Or call:**

**1-800-SMC-4-YOU, Dept. SV06**

\* Source: KeyLabs, Inc., February 1997  
© Copyright 1997 Standard Microsystems Corporation.

\*\*Program is subject to additional terms and conditions, is valid in the US and Canada only, and is available only to prospects qualified by SMC in its sole discretion. Program is subject to change or cancellation by SMC without notice. Limited supply only. Not available to resellers, distributors or Federal agencies.



# Get the most out of your bandwidth

Headlines:

**Put full PBX T1  
over 128 Kbps**

**Put 2 full PBX T1  
plus 1 Mbps data  
over single T1**

Photos:



Name: Kilomux-2000

Description: **Fractional T1** modular multiplexer

**Benefit:** Efficient and cost-effective method of **integrating toll quality compressed voice, fax, data and LANs** at rates up to **768 kbps**. Single or dual main link, redundant power supply and common logic, and integral CSU/DSU. **Drop-and-insert** capability, and **single multidrop** channel. Management via RADview PC platform, ASCII-terminal or front panel.

Application:



Contact: Toll free 1-800-444-7234 or  
[market@radusa.com](mailto:market@radusa.com)  
web: <http://www.rad.com>

ISO 9000,9001,9002 Approved  
GSA#: East GS-35F-3014D West GS-35F-3233D

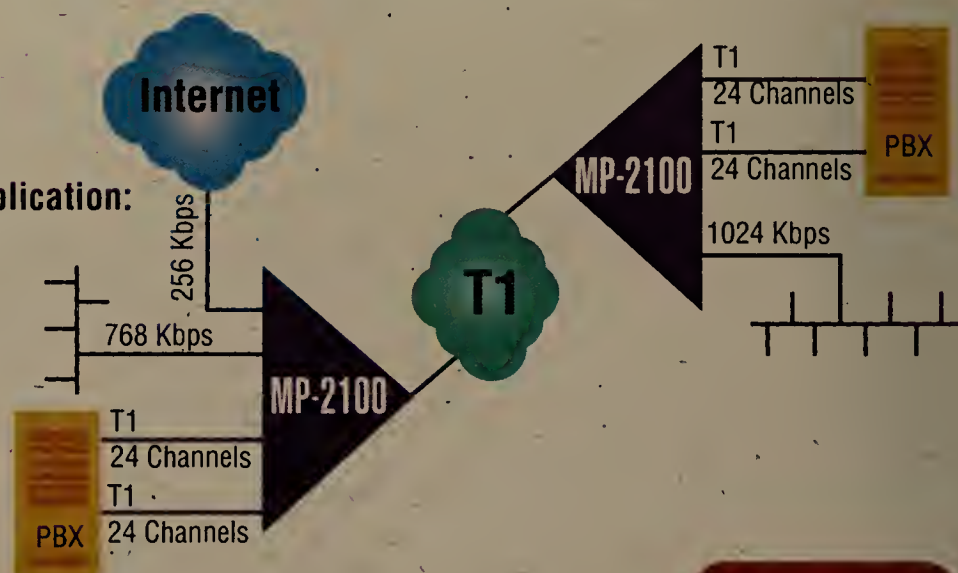


Name: Megaplex - 2100

Description: **T1/E1 integrating voice & data multiplexer**

**Benefit:** Flexible modular TDM integrating data, voice, fax, LAN and video over T1/E1 links on **fiber, copper, microwave, laser or RF** communications. Voice technology expertise: **MPMLQ, ADPCM**, compression of full PBX T1 and standard PCM. Support of 144 voice channels over a single T1 link. I/O modules for **ISDN, routers, DDS and low and high bit rates**. Graphical SNMP management with **HPOV or Windows/PC** platform. **Full redundancy** with dual aggregate links, power supplies and common logic cards.

Application:



**Boring ads. Brilliant solutions.**



data communications

RAD Data Communications, Inc. e-mail: [market@radusa.com](mailto:market@radusa.com) Web: <http://www.rad.com> Toll Free: 1-800-444-7234  
U.S. Headquarters: 900 Corporate Drive, Mahwah, NJ 07430 Tel: 201/529-1100 Fax: 201/529-5777 Midwest: Tel: 847/342-9999 Fax: 847/342-9986 West Coast: Tel: 714/897-2448 Fax: 714/891-1764  
International Headquarters: 8 Hanechoshet Street, Tel Aviv 69710 Israel Tel: 972-3-6458181 Fax: 972-3-6498250



# Intranet Applications

Covering: Messaging • Groupware • Databases •  
Multimedia • Electronic Commerce • Security

## Briefs

■ A group of seven security vendors and consultants, including Axent Technologies, Inc., Bell Atlantic Federal Systems, Georgia Tech Research Institute and IBM, last week announced they will collaborate on an analysis of wide-ranging types of "cyber-threat" attacks and release their findings later this year to the public.



Gorelick gets a response.

Dubbed the **Manhattan Cyber Project**, the effort was made in response to U.S. Deputy Attorney General **Jamie Gorelick's** public statement last year that government needs help from the private sector to combat the cyberthreat to the U.S. network infrastructure.

■ After nearly a year of attracting few shoppers, **IBM** will close World Avenue, its shopping mall on the Internet.

With World Avenue, IBM was responsible for marketing and driving traffic to a Web site, in addition to providing the underlying technologies that powered the electronic commerce taking place there. World Avenue's demise will let IBM refocus on its true business — creating the underlying technology, a company spokesman said.

■ **Perot Systems Corp.** of Dallas has hired **Nets, Inc.'s** technical staff and bid \$9 million for the company's assets, according to a Perot Systems official and a court document.

Nets, Inc., an Internet commerce company headed by former Lotus Development Corp. Chairman Jim Manzi, filed for Chapter 11 bankruptcy protection on May 9. Perot Systems has already hired 58 Nets, Inc. staffers, according to a company spokeswoman.

## Business Objects mixes databases and the Web

WebIntelligence query and analysis tool enables end users to build Web pages from networked databases.

By John Cox  
San Jose, Calif.

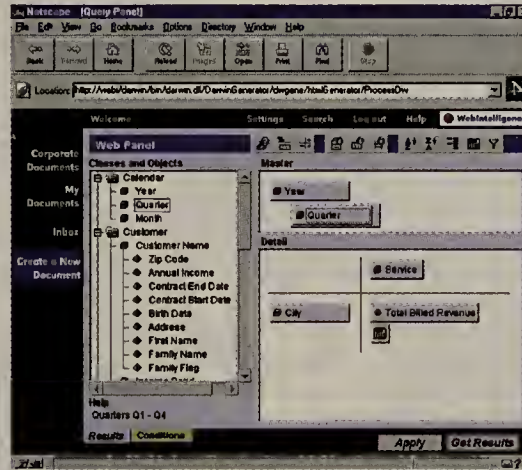
Business Objects, Inc. this week will unveil a Web version of its popular database query and analysis tool that should be easier for companies to roll out to more end users.

The product, WebIntelligence, runs as a set of centrally managed server components that can be accessed by end users with Web browsers. Instead of installing separate Windows programs on hundreds of desktops, customers can exploit the easy-to-use browser interface to provide end users across a company with interactive Web servers to gain access to corporate data.

Using mouse clicks, end users with Java Web browsers can create and execute queries against a range of databases without having to know database structures or the SQL database access language. The results are returned as HTML pages, complete with embedded hyperlinks to relevant reports or more detailed data.

WebIntelligence uses much of the technology and features in Business Objects' popular Windows application, also called Business Objects. But like other Webified versions of existing client/server tools, WebIntelligence shifts much of the application processing load to the server.

The new product relies on distributed architecture, based on Visigenic Software, Inc.'s object request broker (ORB). Distributed architecture enables companies to support more end users with the software by



Users with Java-enabled Web browsers can now graphically create database queries and reports via a downloaded Java applet in WebIntelligence.

deploying multiple copies of the server components — query generator, report generator, security manager, cache manager and so on — across different machines.

"Architecturally, it's more comprehensive than anything

else I've seen," said Howard Dresner, a vice president with Gartner Group, Inc., of Stamford, Conn. "In theory, WebIntelligence extends the reach [of query-analysis features] to a different constituency."

Dresner said the load-balancing features in the initial release are very simple, but the ORB will let Business Objects make this much more sophisticated in the future.

The Naval Center for Cost Analysis in Arlington, Va., will begin beta-testing the product soon. Some 200 end users will run it instead of the existing Business Objects Windows application to query a vast database of operating and support costs for Navy equipment ranging from

airplanes to warships, according to Commander William Mickler. WebIntelligence should make it much easier for MIS staff to support database query activity and extend it to new users, he said.

Business Objects has adapted an administration program from the Windows product for WebIntelligence so managers can represent database fields and tables to business end users in familiar terms, such as "order" or "customers." End users build queries from these terms using mouse clicks and graphical screens. The WebIntelligence server generates the SQL to query the target databases.

WebIntelligence enters beta testing this month and is scheduled to ship by year-end. Pricing will be announced at that time.

© Business Objects: (408) 953-6000

## E-mail outsourcing

### Fabrik layers on the features

By Paul McNamara  
San Francisco

Fabrik Communications, Inc. last week unfurled Fabrik Advanced Options, a patchwork quilt of seven extended features of the company's existing e-mail outsourcing services.

The options include: antivirus scanning based on software from McAfee Associates; an e-mail-to-fax service; a custom control feature that allows administrators to filter messages and attachments; Fabrik/Farcast Business Info, which sends customized news and information directly to a user's e-mail box; a mailing list option; a Web site hosting service; and Fabrik Web Forms, which allow users to access Web pages holding form-based information directly from e-mail.

According to customers and industry analysts,

Fabrik's package will appeal to small to midsize businesses that desire the evolving benefits of wide-area messaging but lack inhouse technical resources. Fabrik customers need not install additional hardware or software at their sites.

One user said the added features will be a welcome addition

to a service he has found reliable and cost-effective.

"These new services are sort of icing on the cake, and we're starting to take advantage" of the antivirus and Farcast options, said Keith Coon, network manager at Commonwealth Technology, Inc., an environmental consulting company in Lexington, Ky.

One industry analyst said e-mail outsourcing companies such as Fabrik need to continually upgrade their feature sets to maintain customer loyalty.

"Once a [user] company starts to become more aware of the possibilities a messaging infrastructure can provide to them and to their customers, they will want to do more with it," said Bob Lewin, an analyst with Dataquest, Inc.

The Advanced Options are available immediately, except for the virus scanning, which will be available by month's end and the custom control feature, due in mid-July. Virus scanning will cost \$50 per month for 100 users, \$225 for as many as 1,000 users. Farcast is priced at \$9.95 per month, per user.

© Fabrik: (415) 439-6600

#### PROFILE: FABRIK COMMUNICATIONS, INC.

Based: San Francisco

Founded: 1994

Senior executives: **Chris Logan**, CEO and founder

**Robb Foster**, chief technology officer and founder

**Max Henry**, president and chief operating officer

**Products:** Fabrik Connect, a service that works within existing LANs and client/server environments to connect to WANs

Fabrik VPN, a service that creates an e-mail virtual private network between an organization and its business partners



www.nwfusion.com

Get more online:

- A Business Objects white paper on Internet-based decision support
- A Planning Sciences white paper on data warehousing and OLAP on the Web





## NET INSIDER

## Flavors of universal access

**Y**ou can actually see your universal access dollars at work — if you know where to look. For example, while on vacation a couple of weeks ago I drove along Notom Road, a 35-mile “unimproved” dirt road just east of Capitol Reef National Park in southern Utah. This is empty country. Well, it is actually quite full of stark beauty, but empty of almost everything else.

It is a few dozen miles west of where some people believe NASA filmed the moon landings. Yet every few hundred yards for more than half the length of the road, there were little off-green boxes along the roadside. I saw the same type of boxes along most of the 3,000 miles of country roads we traveled during this vacation in the Four Corners area.

These boxes are the surface access points for underground telephone cables. Buried cable is far more reliable than cable strung along telephone poles, and the landscape is far better off not cluttered with the poles and wires.

In the case of Notom Road, there is a small farm about 5 miles south of Route

24, the main highway (in the context of the area) and another farm about 15 miles further south. So there are 20 or so miles of buried cable to service two small farms, probably with a single



**Scott Bradner**

phone each. These phones would be very expensive to the subscribers if it were not for the universal access fund used to help pay for the cable installation.

The same fund is also used to offset some of the other costs that make it quite a bit more expensive to operate telephone service in a low-density, rural area than a high-density, urban one.

Now the Federal Communications Commission has ruled that the same universal access fund should be used to help offset the cost of Internet services for non-profit K-12 schools with an endowment of less than \$50 million, as well as libraries. Eligible schools and libraries will “receive discounts of between 20 percent and 90 percent on all telecommunications services, Internet access, and internal connections provided by telecommunications carriers, subject to a \$2.25 billion annual cap” ([www.fcc.gov/ccb/universal\\_service/fcc97157/](http://www.fcc.gov/ccb/universal_service/fcc97157/)).

In addition, the FCC extended the discounts to nontelecommunications carriers such as Internet service providers. The level of discount is determined by the percentage of students in the national school lunch program and whether the area is urban or rural. The school lunch program was chosen because it has a well-defined set of criteria that reflects family rather than community income. Rural

schools and libraries will get a bigger discount than urban ones because the list price of the services is higher in rural areas.

The whole question of universal access is a difficult one. Any universal service plan, no matter how well designed — as I think this one is — increases the costs to some users in order to reduce the costs to others. It will be interesting to see if the better off continue to feel that the unrestricted view and better educational opportunities are worth the added costs.

Disclaimer: Harvard is not in the K-12 business, and anyway, its endowment somewhat exceeds the cap, so the above views are my own.

*Bradner is a consultant with Harvard University's University Information Systems. He can be reached via the Internet at [sob@harvard.edu](mailto:sob@harvard.edu).*





# Tool limits outside access to intranets

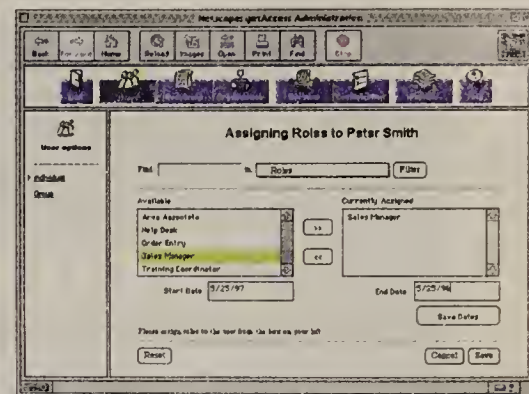
By Ellen Messmer  
Sunnyvale, Calif.

Start-up enCommerce, Inc. today will unveil an intranet product that lets a system administrator control the Web-based

information an outside user can receive.

Called getAccess, the product includes Access Server software that checks the identity of a Web user and a Registry Server that stores user profiles.

After the user with a Secure Sockets Layer-enabled browser is authenticated — by password, ID, cookie or check of the IP address — the Registry Server displays a personalized screen with links to



The enCommerce software lets you handle Web login, authorization and personal profiling.

## Some People Think of Us Each Day the Sun Goes Down.

*For others, everyday is a good day with 99.986% uptime.*



Our unique architecture enables major functions—network protocols, file systems and storage—to operate independently of the OS for increased availability, performance and ease of administration. And with thousands of Auspex NetServers managing hundreds of terabytes of data worldwide, our proven uptime continues to be 99.986%.

What's certainty worth to you? If your job is to manage, protect and deliver life-giving data and information to the world, it's worth everything. Because the world never stops working. Ever. Continuous data access is the gauntlet thrown down at your feet on a daily basis. It's also the real-world benchmark an Auspex server thrives on.

*It fundamentally works because it's fundamentally different.*

Auspex network data servers are unlike any other server on the market. As scalable as they are powerful, Auspex NetServers are designed from the ground up to optimize data flow. Our patented architecture enables major system functions—network protocols, file systems and storage—to

work independently of the operating system. By centering your data on an Auspex server, blinding speed and eye-opening reliability are not mutually exclusive.

*We're not just blowing sunshine.*

Find out why the most competitive businesses in the most demanding industries continue to define Auspex as the data server of choice. Join us for the story at our web site at [www.auspex.com](http://www.auspex.com), or call us at 800-735-3177.

The way we see it, it looks to be just the start of another wonderful day.

The Auspex NS 7000 NetServer family has the only servers in the world to deliver continuous data access when the operating system fails.



THRIVE  
CAREFULLY



authorized Web resources.

"The getAccess servers become a personal application launcher," said Alberto Yopez, president and CEO of enCommerce. "This is a custom menu for navigation."

Any Web server with the getAccess software module will be able to present an authenticated user with the customized information authorized by the Registry Server.

Available for Solaris or Windows NT, the Access Server works with Netscape Communications Corp. or Microsoft Corp. Web servers.

The Registry Server, based on the Oracle Corp. 7.2 database, uses Java "servlets" defined as part of Sun Microsystems, Inc.'s Java blueprint, the Java Development Kit 1.1.

### Servlet with a smile

Java servlets — Java miniapplications that run on the server — can process requests more quickly than Common Gateway Interface (CGI) scripts. CGI is now falling into disrepute with programmers who claim it is too slow due in part to the way scripts open and close connections to databases.

One getAccess beta user, Brigham Young University, has decided to install the product across its campus intranet, dubbed "Route Y."

"We examined about seven products similar to this, and this was the best," said Brad Stone, Brigham Young's manager for special projects in the university computing services. "The enCommerce product was the only software that allowed us to take our Web applications and quickly stitch them under an access framework."

After setting up getAccess-enabled computers and Web kiosks to handle e-mail for roughly half of its 28,000 students without their own gear, Brigham Young will also put up a directory, based on the Lightweight Directory Access Protocol (LDAP), of student and faculty information.

"LDAP looks like the easiest way to consolidate the directories we have out now," Stone said. "We'll let students view the directory information through getAccess," which supports LDAP.

In the winter, Brigham Young plans to set up online chat forums for its 6,500 classes that will use getAccess.

Yopez said getAccess is planned for shipment next month. Pricing will start at \$25,000 for 500 users.

© enCommerce: (408) 733-7800



**YOUR LOCAL MESSENGER  
SERVICE IS ON THE CORNER.**

**YOUR LOCAL COFFEE SHOP  
IS AROUND THE CORNER.**

**HOW COME IT SEEMS LIKE  
YOUR LOCAL PHONE COMPANY  
IS ON ANOTHER PLANET?**



**DON'T WAIT FOR YOUR LOCAL PHONE  
COMPANY TO CHANGE. CHANGE YOUR  
LOCAL PHONE COMPANY TO TCG.®**

TCG is the other local phone company,  
the responsive one—the country's largest  
competitive local exchange company, operating  
in 57\* major markets and serving Fortune 500®  
companies and companies of all sizes since 1985.  
What makes TCG different? At TCG, we bring a  
refreshing customer-first attitude to servicing your

business. You'll receive more attention and quicker  
response to your needs. We can design a telecom-  
munications solution that's tailored to your business,  
whether you need basic local telephone service or  
more advanced applications like data, video and  
Internet services. And you'll find TCG can do it  
all at extremely competitive rates. Can your local  
phone company do that? To find out how we can  
help your business, call 1-800-889-4TCG, or visit  
our web-site at [www.tcg.com](http://www.tcg.com).



# Baby talk: This twisting tot is all the rage on the 'Net

By Paul McNamara

He is known as "The Dancing Baby," a hilarious yet oddly disturbing 3-D video character who is sweeping the World Wide Web with all the momentum of a macrovirus.

Love him or hate him — and some do both — it is tough to take your eyes off this gyrating diaper-clad dynamo, which may explain why he has become such a fixture on home pages, screen savers and bookmark lists.

Not to mention one hit list.

Cool Site of the Day ([www.cool.infi.net](http://www.cool.infi.net)), an advertiser-supported Web page devoted to combing the 'Net for hip little nuggets, recently pointed a less-than-flattering finger at The Dancing Baby.



The Original Unofficial Homepage of the Amazing Dancing Baby.

"Help us find the sick mind responsible for this evil baby," plead the site editors. "Strangely enough, the Internet has embraced this twisted computer-generated baby and even given [it] various popular tunes to dance to. If you know what evil genius created this baby, write us at [cool@infi.net](mailto:cool@infi.net)."

While Cool Site sniffs, others are of a more generous spirit toward The Baby, which has been circulating via Web downloads and e-mail attachments for about a year.

"When I first saw The Baby, I thought it was kind of gross," said Rob Sheridan, a 17-year-old Washington state high schooler who built a Web page dedicated solely to the clip. "But then I started watching it again and said, 'Gee, this is

kind of funny.'"

"Hypnotic" is a word you will hear.

"So far, everybody I've shown this thing to has been amazed and delighted," said Will Irace, a Web site designer from Los Angeles.

There is a Dancing Baby contest — customize your own version to the music you deem most appropriate or, for that matter, inappropriate.

And there is even a genuine Dancing Baby mystery, in that no one seems to know who fathered or mothered the original clip before setting it loose on the Internet.

Although we may not know *who* made The Baby and pushed him out onto the Web, we do know what tools were used.

"The baby was created using [content-creation software called] 3D Studio Max and a plug-in called Character Studio, which is a product that we distribute," said Melisa Bell, a spokeswoman for San Francisco-based Kinetix, a division of Autodesk, Inc. "[The product] was created for us by an outside group called Unreal Pictures."

"I don't know much about the cult following that this baby has, but it's out there," she said.

Sheridan knows plenty. The Bellevue High School junior had posted the The Baby file to his "dinky little home page" months ago only to take it down "because I [wanted to conserve my] server space and didn't think anyone really cared" about The Baby file, he said.

Sheridan may have been right to worry about server capacity — versions of The Baby range from 1M to 6M bytes. But he was wrong in thinking no one would miss his posting.

"I left a little message [on the home page] saying, 'E-mail me if you'd like the file,' and I started getting tons of e-mail," he said. "Tons" in teen-speak being a couple a day.

In an effort to stem that flow, Sheridan put up The Original Unofficial Homepage of the Amazing Dancing Baby at [www.nwlink.com/~xott/baby.htm](http://www.nwlink.com/~xott/baby.htm), which has received more than

11,000 hits since its April 5 debut. He is also compiling a list of The Baby's fans who want Sheridan to e-mail them new versions as they materialize.

That list keeps growing, too, all but assuring that the dancing tyke will be around long after other dance crazes, like the Macarena, have been forgotten. ■

## Not everyone is amused

If it were just The Dancing Baby, network managers might not care. However, all manner of multimedia files — frivolous and work-related — are being shipped as e-mail attachments among friends, coworkers and companies.

The resultant strain on network bandwidth and server storage capacities is no laughing matter. In response, some IS managers have placed arbitrary limits on the size of attachments that will be allowed into their systems, while others have banned attachments altogether.

Stephen Lopez, director of systems and technology at the National Board of Medical Examiners in Philadelphia, is counted among the latter. "I had one person try to pass into our system a 60M-byte MPEG file, a 3-minute video or something," Lopez said. "It's amazing that they didn't think twice."

Despite his anti-attachment vigilance, Lopez said his 150-user mail system continues to accumulate clutter at a rate he finds worrisome.

"I'm up to almost 10G bytes," he said. "That's a lot of mail."

—Paul McNamara

Right now, get the AltaVista™ Security Pack — an AltaVista Tunnel 97 Starter Kit, plus AltaVista Firewall 97 with 25 nodes—for only \$2,995\*. Our "active" firewall actually detects and responds to attacks. And AltaVista Tunnel lets you create a secure virtual private network using the Internet. For OnSite Computing wherever you are, call one of our Business Partners today.

SHL Systemhouse (905) 282-5700  
 HALLMARK COMPUTER PRODUCTS (800) 927-3454  
 MicroAge (800) 814-5305

\*List price. ©1997 Digital Equipment Corporation. AltaVista Internet Software, Inc., a Digital Company. AltaVista is a trademark of Digital Equipment Corp.

AltaVISTA™ Firewall & Tunnel  
 OnSite Security <http://altavista.software.digital.com/security>



# HERE'S THE ANSWER. WHAT'S THE QUESTION?

*Since the way you use your network has changed dramatically, now is an excellent time to question its conventional design. Put simply, your rigid system isn't equipped to handle the fluid movement of intranet traffic, Internet access, and new applications that take advantage of both. Enter Adaptive Networking.*

cornerstone technologies: Access, Switching, IP Services, and Network Management.

**Q • WHAT ABOUT RELIABILITY?**  
When your network goes down, so does productivity. Not to worry. Adaptive networks are inherently more

provides the powerful ability to visualize and analyze real-time traffic flow across your entire network. Intelligent agents monitor your network infrastructure, keeping your IT staff informed of changing conditions and often making adjustments as needed. What's more, Optivity includes analytical tools for capacity planning to help reduce budget surprises.

**Q • WILL IT WORK WITH WHAT I'VE ALREADY GOT?**  
Of course. It wouldn't be truly adaptive if it didn't. You can adopt this technology at your own pace in cost-justifiable increments. Adaptive Networking even makes our competitors' products smarter and faster. Good news, since you probably already own some.

**Q • CAN IT GIVE MY BUSINESS A COMPETITIVE EDGE?**  
Definitely. You can offer hot, new services and build closer links with customers and business partners. Should they need access to your corporate network from the Internet, you can offer secure virtual private network connections. Want to add voice-over-IP capabilities to link customers and service representatives from your Web site and reduce long-distance phone costs? Adaptive networks can do this and much more.

## Adaptive Networking

**Q • ALL RIGHT, WHAT IS IT?**  
Adaptive Networking is a set of products and cornerstone technologies that transition today's networks to the IP-optimized networks of tomorrow. The aim of Adaptive Networking is to build networks that are invisible to users, worry-free for network managers, and strategic for the business.

**Q • WHAT DOES IT OFFER?**  
Our philosophy is centered around more services with less complexity. How? Through transparent scalable technologies that ensure long-term, non-disruptive network evolution; drive operational productivity at every level of the organization; and adapt to changes in network usage and business requirements.

**Q • WHAT ARE THOSE SCALABLE TECHNOLOGIES?**  
Bay Networks products are being developed around industry-leading

reliable and scalable thanks to symmetric multiprocessing and a distributed architecture. In other words, there's no single point of failure to bring down your network. Moreover, the system automatically reroutes traffic as needed to avoid bottlenecks. And you can easily add to, change, and modify your network without disrupting users.

**Q • HOW CAN I REDUCE NETWORK OWNERSHIP COSTS?**  
Adaptive networks automatically find and configure new devices to save your IT staff considerable time. And thanks to our Autosensing Technology, the system determines which users have 10Mbps or 100Mbps capabilities, for example, and matches them with the bandwidth they need.

**Q • HOW CAN WE AVOID SURPRISES?**  
With Optivity®, your IT staff can proactively manage all the devices in your network as one cohesive system—even if it extends across the Internet. Optivity also

**Q • WILL IT WORK WITH THE LATEST APPLICATIONS?**  
Applications drive your network needs. That's why adaptive networks shift on the fly to match routing priorities to your applications. For example, financial transactions and video conferencing can take routing priority over e-mail packets and Web browsing.

### ANY QUESTIONS?

If your network can't do all of this, it's time to start asking a few questions of your own. For a free strategy paper, visit [www.baynetworks.com/adapt/a6](http://www.baynetworks.com/adapt/a6) or call 1-800-8-BAYNET ext. 297. Adaptive Networking is exactly what your business needs. Without question.





# Group slams Web sites for lack of privacy policies

By Ellen Messmer

Washington, D.C.

About half of the most popular Web sites collect personal information about visitors, but few sites have policies for informing visitors about how this information will be used.

That information was among the major findings of a study released last week by the Electronic Privacy Information Center (EPIC), a public interest group based here.

"It's our sense that [privacy policy] self-regulation is not working," and that the government should step in with regulation to protect consumers, said Marc

visited sites each day.

Among the sites singled out for criticism in the EPIC report was Pathfinder, the fifth most popular site. The site was said to collect information about subscribers, but had no privacy policy.

Also criticized in the EPIC study was 19th-ranked [www.disney.com](http://www.disney.com), which registers users and markets information about anyone who is 16 and older, Rotenberg said. He said companies should be required to get parental consent before obtaining information from children.

The Walt Disney Co. did not have an immediate comment about the EPIC study.

tor agrees, Sony will use the personal information for its own marketing purposes or for resale to other firms.

EPIC was critical of several other popular sites as well, such as those run by C/Net, Inc. and Apple. The group said

that these organizations' sites collect personal information without posting privacy policies.

Not all is wrong with the 'Net, however, according to EPIC. The group lauded HotWired.com, Amazon.com and the Cricket Home Page at [www.cricket.org](http://www.cricket.org) for providing clearly visible, appropriate privacy policies for Web visitors. ■

*"Few of the sites have privacy policies, so if a person goes to the Web site and gives up his or her name, they have no way of knowing how it will be used."*

Marc Rotenberg, director, Electronic Privacy Information Center



Rotenberg, EPIC's director.

EPIC's study, "Surfer Beware: Personal Privacy and the Internet," looked at the Web sites that on June 5 were ranked as the top 100 sites by [www.100hot.com](http://www.100hot.com), which compiles the list daily in cooperation with Digital Equipment Corp.'s AltaVista search engine service.

The top sites include those from Disney Entertainment at [www.disney.com](http://www.disney.com), several news organizations and computer industry players such as IBM, Hewlett-Packard Co. and Apple Computer, Inc. Not surprisingly, search engines such as Yahoo, Excite, Pathfinder and AltaVista were among the top 10 most frequently

Rotenberg also voiced criticism about another site popular with children — Sony Music Entertainment, Inc.'s [www.sonywonder.com](http://www.sonywonder.com) — saying Sony Corp. "plied children with the promise of a Sony Discman to disclose information about themselves."

"That information is collected so we know who you are," said Matt Rothman, Sony's senior vice president of online ventures. Sony, which posts its privacy policy, wants to be able to "be sure people are who they say they are" when they go into the online chat forums, he said.

According to Sony's published privacy policy, if a [www.sonywonder.com](http://www.sonywonder.com) Web visi-

## Borland builds up IntraBuilder tool

By John Cox

Simi Valley, Calif.

Borland International, Inc. has released a new version of its IntraBuilder tool for creating database applications accessible via Web browsers.

Version 1.5 boasts improved performance, management capabilities and scalability on the server side, said Klaus Krull, IntraBuilder product manager. IntraBuilder features a set of programs linked to a Web server that handles session management, transaction control and similar tasks on behalf of a Web browser request.

From the outset, IntraBuilder was designed as a set of easy-to-use graphical editors, wizards and designers, all based on Netscape Communications Corp.'s JavaScripting language.

The tool allows developers to use mouse clicks to create HTML forms, incorporate ActiveX and OLE Custom Controls and then link these via Open Database Connectivity or high-performance native connections to

back-end databases.

IntraBuilder was released on Windows NT when the Borland software made its debut in September.

Version 1.5 will run as a full-fledged Windows NT Service, which means administrators can use NT management services to remotely manage IntraBuilder servers across a network.

The updated edition of IntraBuilder also promises 25% faster access to data for Web browser users linked to servers via HTTP.

In addition, Borland has added the Business Object Broker, which can take Web requests from IntraBuilder clients and distribute them over several IntraBuilder servers for better performance and availability.

The new release also has faster native SQL connections to the leading relational database management systems.

IntraBuilder 1.5 is available now for \$1,995. A 30-day free trial version is now available from [www.borland.com](http://www.borland.com).

© Borland: (408) 431-1000

**\* JUST ADD BROWSER**

Put the power of AltaVista Search to work on your PC with AltaVista Search Personal extension for only \$29.95\*. Or, get a handle on all your corporate knowledge with the AltaVista Search Enterprise Pack—enough search power for 250 users for just \$15,995\* for OnSite Computing wherever you are. Call one of our Business Partners today.

**ALTA VISTA Search**

OnSite Knowledge <http://altavista.software.digital.com/search/>



## Search Engines

# Searching for true knowledge

**I**ntranet search engines are the most basic and widely used tools for finding and accessing information housed on companies' Internet-based computer networks.

Many of these products sprang from earlier ones designed to locate and retrieve data from databases, file systems and other legacy systems before intra-nets took hold across corporations.

Now intranet search engines are evolving into more sophisticated offerings called knowledge management tools. Knowledge management is a somewhat fuzzy term and means different things to different people. Basically it refers to harnessing companies' intellectual assets by quickly getting the right information into the hands of the right end users.

Search engines often make up just one part of a broader knowledge management product package. Whereas the market for knowledge management software and services is forecast to reach \$5 billion by the year 2000, according to Jim Bair, research director for Gartner Group, Inc., the niche market for intranet search engines is expected to maintain its current \$500 million annual revenue rate.

In response, leading intranet search engine vendors have repositioned themselves as knowledge management companies. They offer strategic services and software tools that include intelligent agents, push technology and database crawlers able to search across multiple platforms.

Five of these vendors — Verity, Inc., Fulcrum Technologies, Inc., Excalibur Technologies Corp., Dataware Technologies, Inc., and Information Dimensions, Inc. (IDI) — account for more than one-third of the intranet search engine market (see graphic).

The major challenger to these intranet search engine leaders may be Microsoft Corp., which offers customers its Index Server text-retrieval software for free. But to date, Microsoft has not focused seriously on this market.

Then there are the commercial Internet search engine vendors — Digital Equipment Corp.'s AltaVista, Excite, Inc., Lycos, Inc. and Infoseek Corp. Although all of these companies have high name recognition, META Group, Inc. analyst David Yockelson says they lack the precision technology to compete with the intranet market leaders.

Other competitors include start-ups such as Sovereign Hill Software, Inc., Inference Corp. and Magnifi, Inc.

What follows is an overview of the intranet search engine/knowledge management leaders.

## Verity

Founded in 1988, Verity is often cited by analysts as the top company in the information retrieval market, despite ranking fourth in market share. Customers include Federal Express Corp., MCI

By Chris Nerney

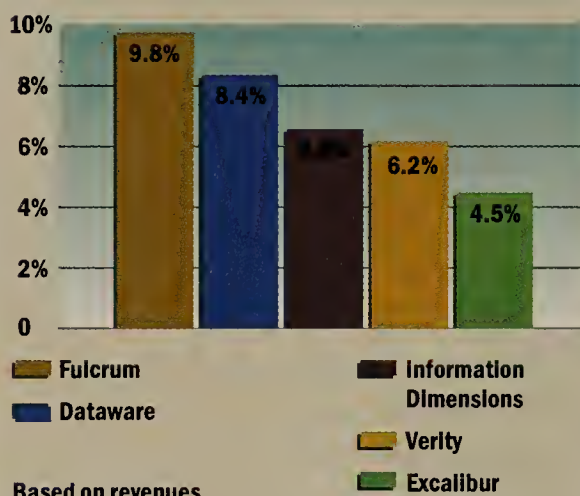
## WHAT KNOWLEDGE MANAGEMENT HAS TO OFFER

Analysts say using several data retrieval tools as part of a knowledge management strategy allows companies to achieve:

- Faster problem-solving
- Improved decision-making
- Lower Research and Development costs
- More worker independence
- Better customer relations

## MARKET LEADERS

1996 search software market share



SOURCE: DELPHI CONSULTING GROUP, BOSTON

Communications Corp. and Raytheon Corp.

Verity's flagship product is SEARCH'97, an application platform containing a group of tools designed for accessing information from many data sources across an enterprise.

SEARCH'97 features agent technology designed to proactively search, filter, categorize and deliver information to users; database gateways that allow for cross-database searching; and an intranet spider for indexing data.

It includes a user interface for the desktop, an information server and an agent server. Pricing starts at \$1,995 per server.

Verity is based in Sunnyvale, California.

## Fulcrum

Based in Ottawa, market leader Fulcrum was founded 14 years ago and, according to Gartner analyst Bair, pioneered "brokering technology."

Brokering technology allows users to index information residing on networked computers and execute simultaneous inquiries across network resources.

Key to the company's Knowledge Network product is a feature called Knowledge Map, a folder hierarchy that shows users the information sources available to them through the corporate intranet, says Peter Klante, Fulcrum's vice president of marketing.

Knowledge Network 2.0, released in late May, consists of software that sits on a Web server and can be accessed via standard Web browsers. Version 2.0 is priced at about \$400 per desktop.

## Excalibur

Excalibur's Visual RetrievalWare software was developed specifically for finding data in a multimedia age, says Mark Demers, the company's director of marketing.

The software, released late last year, is designed to index and retrieve text, photos, video, audio and animation via Boolean language as well as statistical, semantic and pattern recognition.

Excalibur also has a product specifically for text searches, RetrievalWare 6.0. RetrievalWare is priced from \$29,500 for one server up to \$97,500 for unlimited servers.

The Visual RetrievalWare application developers kit costs \$49,950. Both products run on multiple platforms.

Later this month, the Vienna, Va., company expects to announce a new version of Visual RetrievalWare.

## Dataware

Originally a supplier of software and services to the CD-ROM market, Cambridge, Mass.-based Dataware entered the online search and retrieval market in 1994 when it purchased BRS Software Products.

According to Barclay Rockwood, director of search products, the key to Dataware's NetAnswer knowledge management technology is that it utilizes its own database.

Once information is found, it is placed in the database, eliminating the chance of it disappearing from a non-Dataware data source.

In March, Dataware released NetAnswer 2.0, a query and retrieval system featuring relevance ranking and natural language processing.

The \$15,000 package is compatible with major Web browsers and consists of a server and database.

## IDI

IDI, based in Dublin, Ohio, was founded in 1986 as a spin-off from Battelle Memorial Institute, a research think tank that developed a text-retrieval product called Battelle's Automated Search Information System (BASIS).

IDI has since developed a BASIS Intranet package for Unix and NT networks that includes a document manager, a Web server gateway and client software. It is priced at \$34,000 for a five-user license. ■



ALL THE NICs YOU COULD EVER DREAM OF.

THAT IS, IF YOU'RE TWISTED  
ENOUGH TO ACTUALLY DREAM OF NICs.

We don't know what Freud would say on the matter of NIC-induced anxiety. However, should you find yourself in a similar state of concern, we'd like to suggest the Compaq Netelligent family of NICs.

After all, no matter what environment you oversee — Fast Ethernet, Ethernet, Token Ring or FDDI — there's a Netelligent NIC with industry-leading features and price:performance that's perfectly suited for your network. Which explains why over 40% of all installed servers rely on Compaq NICs.

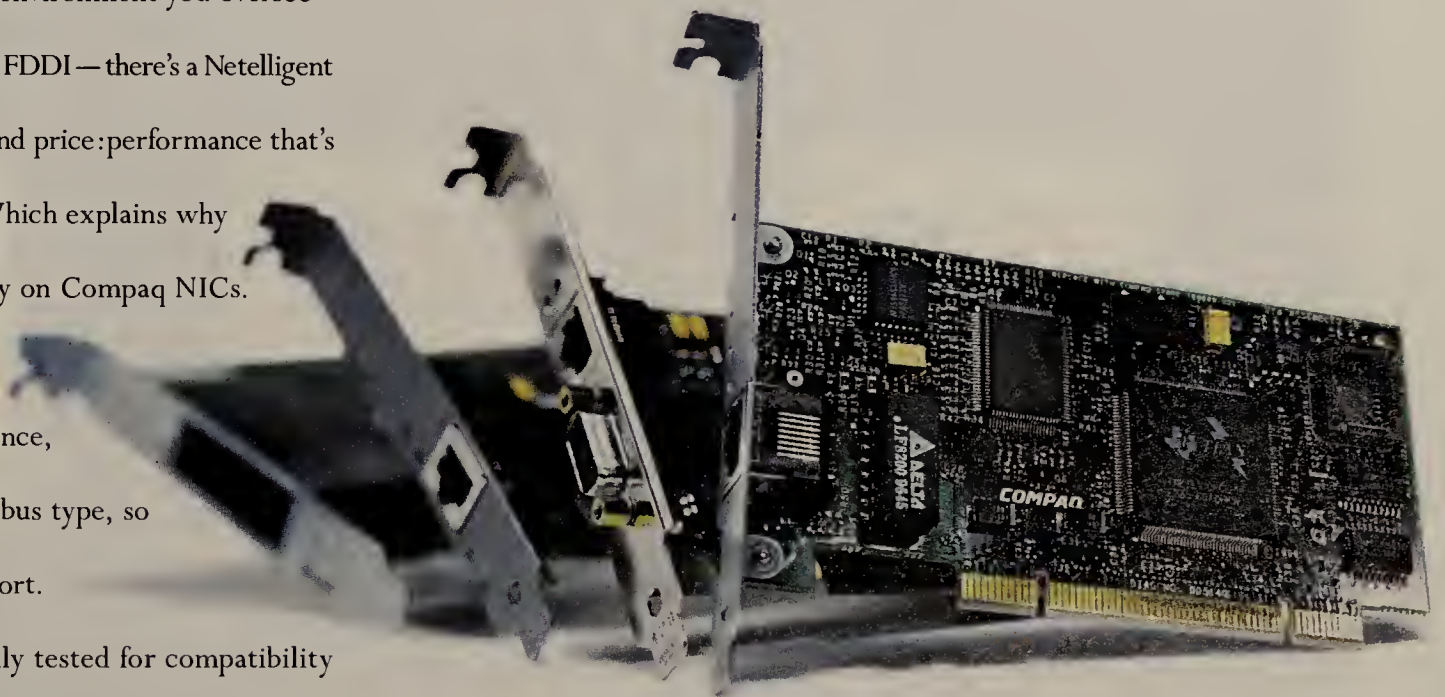
The fact is, no one knows NICs better than Compaq. For instance, our products work with every major bus type, so your own variety is guaranteed support. And because they've been thoroughly tested for compatibility on every popular open platform, all deliver ease of integration and high performance. Finally, each offering reflects the very latest advances. Like Adaptive Performance Optimization in our Fast Ethernet NICs, redundant server support in our FDDI NICs, and Scalable Clock Architecture in our Token Ring NICs.

All things considered, you won't find a more comprehensive and innovative group of NICs. And if that doesn't ease



your mind, you may need some more serious help.

To learn more, visit us at [www.compaq.com](http://www.compaq.com) or call 1-800-544-5255. Pleasant dreams.



*NICs for each and every environment — the Compaq Netelligent family:  
10/100 TX PCI UTP (Fast Ethernet), 10BaseT PCI UTP (Ethernet),  
4/16 TR PCI UTP/STP (Token Ring), and 100 FDDI PCI SAS UTP (FDDI).*

**COMPAQ**

Has It Changed Your Life Yet?



# NetworkWorld Gallery of *Excellence Awards*



**NEAL AWARD**  
Certificate of Merit  
**Best Single Issue**  
**10th Anniversary Issue**  
Issue: April 29, 1996



**NEAL AWARD**  
Certificate of Merit  
**Best Subject-Related Series**  
**Internet Health Report Series**  
Issue: Sept. 16, 1996 and  
Sept. 23, 1996



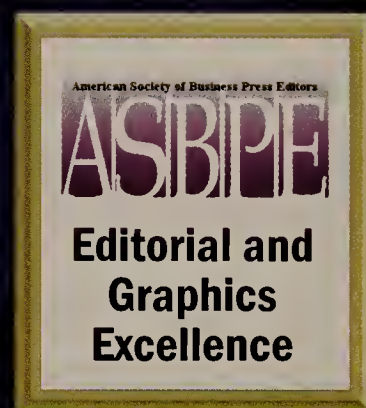
**FOLIO: AWARD**  
**Editorial Excellence**  
**Information Technology Trade Category**  
Year End Power Issue  
Issue: Dec. 15, 1996/  
Jan. 1, 1997



**Top 50 Magazines**  
**Network World**  
ranks in **top 20**



**Trade Magazines**  
John Gallant  
**Top 10: "good edit/  
business mind"**  
**E-Publications**  
Adam Gaffin  
**Top 10:**  
**"qualified audience"**



**Four-Time Award Winner**  
**IntraNet magazine**  
July and August, 1996  
**Network World**  
Contents page, Nov. 11, 1996  
and Cover, Dec. 2, 1996

*Network World* is honored to be recognized for its journalistic and graphic excellence that combine to best serve the needs of its readers who rely on *Network World* each week for the news and information critical to their career success. To be acknowledged by so many who are respected in the industry is truly testament to *Network World's* unwavering commitment to excellence.











# Technology Update

Covering: Evolving Technologies and Standards

## NUTTER'S NETWORK HELP DESK

Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 476, or send your questions to [rnutter@world.std.com](mailto:rnutter@world.std.com).

**We have a Windows NT server (app/dial-in) connected to a Novell, Inc. backbone. We want to use the NT server for dial-in to keep the load off the NetWare servers. I don't trust NT security and would like to find a third-party solution that won't cost an arm and a leg or require additional hardware, such as Citrix Systems, Inc.'s WinFrame. Do you have any ideas?**

### Via the Internet

One option is installing a four-port RocketPort Quad communications card from Comtrol Corp. ([www.comtrol.com](http://www.comtrol.com)) in your NetWare server. I have had one of these multiport cards running in the lab for several weeks and haven't noticed any additional utilization.

I attribute this to the board's efficient processing. I have had good luck installing this card in servers that were running 30% to 50% utilization without any noticeable impact on the server.

If you are really concerned about the utilization on the NetWare server, you can put NetWare Connect on a stand-alone box using a run-time copy of NetWare that ships with eight-port versions of Connect. Alternatively, you could try getting your hands on a two-user version of NetWare 4.11.

Recent updates to NetWare Connect have enhanced its utility with Windows 95 and NT. I have set up NetWare Connect to establish a simultaneous IP and IPX connection, for instance.

You may want to check with your reseller about the status of a recent Digiboard, Inc. promotion. During the promotion, if you purchased an eight-port Digiboard, you received an equivalent copy of NetWare Connect for just a few dollars more.

With a snap-in Dynamic Link Library to NetWare Administrator, you can handle nearly all of the administration in NWAdmin.

## NHRP: Key for multivendor switched IP nets

*The IETF is close to finishing the standard for integrating frame relay and ATM SVC services with IP routing.*

By Dan Dearing and Neil Snyder

For all practical purposes, the Next Hop Resolution Protocol (NHRP) is soon expected to become an IP standard for integrating multivendor circuit- and packet-switched networks and for linking Multiprotocol over ATM clients to their servers.

The Internet Engineering Task Force (IETF), which has been working on NHRP since October 1993, is expected to publish the specification in a request for comment later this year. To date, the protocol has undergone 11 revisions.

NHRP plays a significant role in integrating connection-oriented circuit-switched networks such as frame relay and ATM and connectionless packet nets such as the Internet, intranets and other predominantly routed IP networks. The motivation for integrating the two types of nets is the leveraging of switched virtual circuits (SVC) for improved performance and end-to-end delivery of quality of service (QoS).

Unlike permanent virtual circuits (PVC), SVCs have the ability to support cut-through routing and dynamically negotiate bandwidth allocation, priority and QoS. These factors are important for frame relay and ATM networks alike, and in the latter's case, the importance extends through the WAN and into the campus LAN.

Cut-through routing provides for better network efficiency and performance than IP nets that are built over switched networks with a hub-and-spoke configuration and several layers of concentration. The hub-and-spoke configuration results from PVC connections between the IP nodes.

With cut-through routing, the frame relay/ATM network determines the best path across the network. In other words, the traffic cuts through the net, bypassing the hub-and-spoke topology and the multiple hops it adds to the path. Secondary benefits include better traffic distribution and, in the case of WANs, lower overall bandwidth costs.

SVCs also are beneficial because of the ability to dynami-

cally request and negotiate all the service-related parameters at setup. The PVC approach requires a network database change and, in the case of carrier services, a subscription change order to modify values.

NHRP's role in cut-through routing is to provide IP nodes with the frame relay/ATM address associated with the destination at the SVC setup. This eliminates the tedious process of statically configuring address mapping tables in each IP node.

to the vendor's implementation. Events include the receipt of specific protocol types, IP addresses or application socket numbers. These details are transparent to deployed IP applications.

More robust implementations of NHRP provide for the ability to deliver application-specific policy information to NHRP clients, allowing for specific forwarding priorities and bandwidth allocations at SVC setup. This capability provides a service similar to the proposed

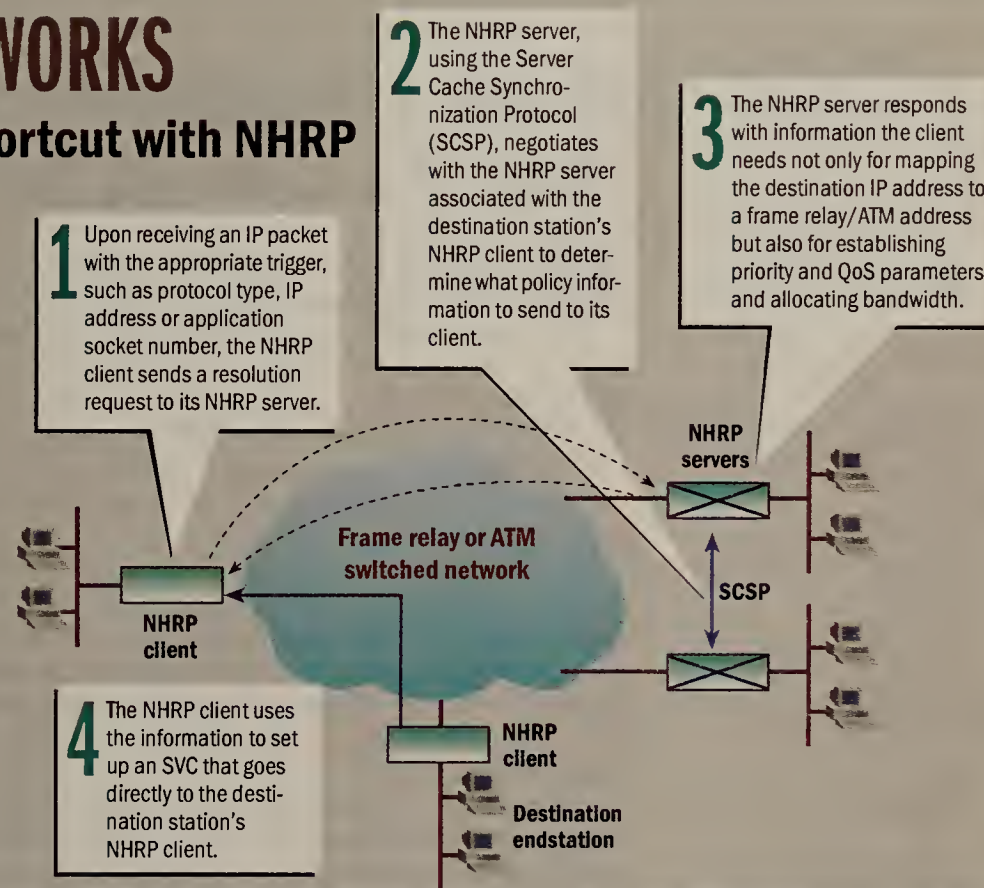
relatively cheap and unconstrained. It does not provide any of the dynamic bandwidth allocation services or the traffic policing needed to ensure users adhere to the agreed QoS.

Tag Switching, on the other hand, is positioned to provide for consolidation of the enormous amount of routing information in the Internet core. It is safe to assume any technique that consolidates, or hides, information will not perform well when more resolution into the

## HOW IT WORKS

### Taking a shortcut with NHRP

The IETF's impending Next Hop Resolution Protocol (NHRP) standardizes the integration of IP routing and frame relay/ATM switched virtual circuit (SVC) services. With NHRP, traffic cuts through the switched network directly to its destination rather than moving across the network in a series of hops.



NHRP has three distinct components associated with the integration technique: the NHRP Client-Server interface, a Server-Server interface described by the IETF's Server Cache Synchronization Protocol (SCSP) and the Client-Client interface described in the IETF's ongoing router-to-router work.

NHRP is built according to a client/server model. Clients are the endpoints and servers are deployed throughout the network's core. Clients consult the server when they need resolution information to forward traffic. The trigger for an NHRP client to consult its server is left

Resource Reservation Protocol, which requires existing applications to become RSVP-aware.

Server-to-server communications provided by SCSP enable large, scalable NHRP-based networks via a distributed and fault-tolerant resolution service.

Many vendors — including Cisco Systems, Inc. with its Tag Switching and Ipsilon Networks, Inc. with its IP Switching — have outlined their schemes for integrating switch and router functions. They do not go as far as NHRP, however. IP Switching is primarily applicable to campus-based networks in which one can reasonably assume bandwidth is

traffic flow is needed to recognize and preserve QoS.

NHRP is most applicable for improved application performance within campus LANs and across the WAN. The availability of frame relay and ATM SVCs from public carriers also will enable the use of NHRP over public data service nets.

*Dearing is marketing director and Snyder director of access product marketing at Hughes Network Systems, Inc. in Germantown, Md. Dearing can be reached at (301) 601-4226 or [ddearing@hns.com](mailto:ddearing@hns.com), and Snyder at (301) 601-4007 or [nsnyder@hns.com](mailto:nsnyder@hns.com).*





## A Gigabit Ethernet Face-off: Who's in?

**G**igabit Ethernet is coming under the spotlight, literally. With backing from the NetWorld+Interop Atlanta conference, which will be held Oct. 6 to 10, I'll be hosting the first-ever, presidential-style debate among Gigabit Ethernet vendors. But I need your help to pull this off.

The event is aimed at getting beyond the incredible hype about Gigabit Ethernet to determine just where this technology can and should be deployed, how it will integrate with your existing networks and which vendors are best positioned to help you deploy it. Gigabit Ethernet has enjoyed a rapid rise to stardom in the network industry — even though the technology hasn't been standardized and few products are actually shipping.

In the face-off, top technology executives of the leading Gigabit Ethernet companies will have to answer tough questions from a panel of industry experts and their market rivals. We'll cut through the fluff and marketing statements to get at what's real in this nascent market and help you make smarter buying decisions.

This Interop event will build on the success of the Switching Showdown we held in February at ComNet that pitted the representatives of Cabletron, Cisco, 3Com and Bay against one another. That session, which drew more than 600 ComNet attendees, helped pin-

point real differences in the Big 4's switching strategies — differences that were hidden by their utopian marketing messages.

For the Gigabit Ethernet Face-off at Interop Atlanta, I'll invite a mix of established internetworking companies and start-up vendors to participate. That way, we can assess the established players' commitment to this new technology — are they excited about it or taking a defensive stance? — while grilling the start-ups about their strategies for competing against companies with broader product lines.

For the debate to work, I can only invite four, maybe five, vendors. But nearly all the established vendors have announced Gigabit Ethernet rollout plans and there are a dozen or more start-ups.

That's where you come in. Who do you want to see on this panel?

Analysts I've surveyed cite Cabletron, Cisco and 3Com as the most likely candidates among the larger companies, but Bay's expected acquisition of Rapid City — an analyst consensus pick among the start-ups — could change that. Other start-ups cited as top candidates by the experts were Extreme Networks and Prominet.

With your help, I'll narrow the field and challenge the CEOs to send their chief technology officers to the face-off.

So you tell me. Who should be in the Gigabit Ethernet Face-off?

*John Gallant, editor in chief*

[jgallant@nww.com](mailto:jgallant@nww.com)

*Telecom Regulation • Alan Pearce*

## Hundt's departure signals start of a new era for FCC

**B**y late summer or early fall, Reed Hundt, chairman of the Federal Communications Commission, will be gone — but certainly not forgotten. His 3 1/2-year reign will go down as one of the most momentous in the history of the telecommunications industry, in large measure because of the passage of the Telecommunications Act of 1996.

Unlike most of his predecessors, Hundt won't be gone forever. He will be back in the fray in the year 2000 to work on the presidential campaign of close friend Al Gore.

On top of Hundt's departure, there are three other commissioner vacancies to be filled, which means the FCC will likely begin to move in radically different policy directions. Hundt's hard-hitting, sometimes argumentative style made enemies. His successor, if he or she is to preside over a successful deregulatory and competitive transition, must orchestrate policies that please both Congress and different industry segments.

Perhaps the most puzzling policy paradox that must be resolved is why industry consolidation is outpacing competition. Somewhat perversely, the FCC and the Department of Justice are primarily responsible for the upswing in mega-mergers. In last month's access charge reform policy, the FCC — at the insistence of the Justice Department — introduced a new productivity factor that will push the consolidation and convergence trend and postpone (perhaps permanently) the onset of real competition.

The productivity factor is supposed to represent a reasonable annual productivity growth in the telecom industry and mandate that some of those gains accrue to consumers in the form of lower or stable prices. The previous productivity factor ranged from 4% to 5.3%. Under the new plan, the productivity factor was set at 6.5%, backdated to July 1, 1996. The purpose of this increase is to lower telecommunications service prices — and lower prices take precedence over competition, at least for now.

This higher productivity factor, however, places a heavy burden on local telephone companies. Generally, telecom company productivity can be increased in three ways: layoffs or downsizing; growth in traffic volume over the same facilities without increasing costs; or implementation of new, less costly, more efficient technology.

To achieve the new productivity factor via further layoffs, the

major telecom conglomerates must continue to consolidate. Increasing traffic volume over the same facilities is not an option because competition, mandated by the Telecommunications Act and allegedly encouraged by the FCC and the Justice Department, could significantly reduce or even eliminate gains in traffic volume. Therefore, more consolidation is needed.

Yet more consolidation is supposed to be antithetical to the FCC and the Justice Department. Neither wants more consolidation resulting in less competition. But under current policies, the only way to meet the productivity factor is to hope for major technology breakthroughs in order to contain costs — and to consolidate. This is perhaps the major reason why AT&T and SBC Communications, Inc.-Pacific Telesis Group are talking of a merger.

In short, the Justice Department and the FCC are promoting a consolidation trend that will result in more mergers and acquisitions and less competition. This is the first and most serious policy conundrum that faces the new FCC.

Whoever heads the FCC must chart a bold course that includes consistent, not conflicting, policy directions. The new chairperson must lead the charge to the promised land of true market-based competition and deregulation, along with the continued encouragement of technological breakthroughs.

If he or she is successful, we will see the beginnings of some real competitive benefits — perhaps even before Reed Hundt returns to active duty in politics.

*Pearce is president of Information Age Economics, Inc., a Washington, D.C.-based research and consulting group. He can be reached at (202) 466-2654.*

## MESSAGE QUEUE

Send letters to [nwwnews@nww.com](mailto:nwwnews@nww.com) or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

### Differing token-ring views

Regarding your article "Cisco cranks up Fast Token Ring" (May 26, page 1):

I work for state government. We have a huge investment in token ring. It was a monumental feat to get a 17,000-employee agency to agree on a standard. The switch to ATM would require an equal or greater effort.

Faster Token Ring? Hey, that's just another model number. It's still token ring, so it's still standard.

There was nary a ripple when we moved from 4M bit/sec to 16M bit/sec token ring. But just try to put through a purchase order for ATM and





## Finding the perfect flavor of xDSL

If flavors of technology are like flavors of ice cream, buyers should be flocking to digital subscriber line (DSL) parlors for the variety alone. Since early May, we've had asymmetric DSL (ADSL) vendors "charging ahead," "jointly developing" and even "unveiling ATM-based ADSL." At the same time, other vendors such as Newbridge Networks, Inc., Cisco Systems, Inc., Ascend Communications, Inc. and Adtran, Inc. are promoting ISDN DSL (IDSL), a 128K bit/sec, permanent-connection form of ISDN. Finally, there's good old high-speed DSL, championed by market leader PairGain Technologies, Inc.

Is there any substance behind all this activity? The regional Bell operating companies that push ADSL and that have entered into a deal with Alcatel Data Networks, Inc. still bravely assert they will be offering ADSL for \$50 per month. Industry rumors, however, say that the deal between Alcatel and the RBOCs doesn't really guarantee that price level, and even the higher prices the contract allows won't be met any time soon.

The truth is that Ariel Corp., the company that's pushing ATM-based ADSL, may have the best grasp of the issues. Sure, in terms of probability, marrying ATM and ADSL may be, as one cynical New York network buyer recently told me, "like getting struck by lightning while riding on a UFO." The point is that ATM over ADSL underscores the indisputable fact that ADSL itself isn't anything a buyer can use; it's what you deliver over it that counts. The corollary is that cost assumptions for any sort of xDSL must include the cost of what goes over it.

Today, you get 20K bit/sec analog dial-up Internet access for about \$20 per month. If you want that same service on a dedicated port so you can stay on full time, you'll pay between \$90 and \$120 per month. Make the service 56K bit/sec and the price goes up another \$10 or so. If you want a full T-1 connection to your Internet service provider, you're talking thousands of dollars per month.

Enter ADSL, which offers one-third of a T-1 from the user inward and four T-1s from the network out. Suppose the techno-planners at the RBOCs are right and you can deliver ADSL for \$50. What, then, will the Internet connection cost? Do you really think your ISP could deliver fractional T-1 bandwidth for less than a dedicated modem connection? If not, basic ADSL access to the Internet priced in the \$200-per-month range is available. Early ADSL Internet access from providers such as Pacific Bell is more than \$100 per month, and there's no assurance that price will be sustained when a lot of users try to get the service.

What about IDSL? Obviously, it would be a lot easier to provide Internet access at

64K or 128K bit/sec than 6M bit/sec. At least one ISP, UUNET Technologies, has already announced national IDSL deployment, but there are issues even with IDSL.

One is the way it is installed by the carrier. Some vendors, such as Ascend, are linking IDSL with terminal servers. Most carriers don't have terminal servers in their wiring centers today, so this form of IDSL begs the question of how the connection from user to server is made.

Newbridge and Cisco are designing their IDSL strategy based on compatibility with channel banks, devices that are in the wiring centers. They're relying on the fact that channel-bank IDSL is an easy upgrade from analog telephony to promote their concept over the offerings of Internet access giant Ascend.

On the downside, the capacity of IDSL is too limited to make it attractive as a voice-plus-data or video choice. Voice concerns may be legitimate because without integrated voice, the IDSL link to a home will be in addition to the current voice line.

Some vendors are working on IP- or frame-based voice, but its quality probably won't satisfy users. Video? ADSL was once highly promoted as a mechanism for delivering video dial-tone. Look at your phone; is it looking back? If not, write video dial-tone off as more hype.

We need to relearn the lesson of ATM: Bits cost money.

There is a serious risk that the overpromotion of fast-and-sexy xDSL options will simply price the buyers out of the market.

Speed isn't the issue for the next generation of the Internet; it is permanent Internet connection.

The biggest changes in commerce, education and entertainment the Internet can bring about are the result of having a large population of users available all the time, not just when they dial up. An Internet that has to support a population of millions of new, permanently connected users will have enough challenges to face without trying to offer megabits of service for tens of dollars.

A search of the PR wires finds hundreds of ADSL releases and only seven for IDSL. That may reflect the balance of interest in an entertainment sense, but it doesn't reflect the balance of reality. The increased range of exploration for xDSL is a good thing, but we need to keep looking to be sure we find an answer people will really buy.

*Nolle is president of CIMI Corp., a technology assessment firm located in Voorhees, N.J. He can be reached at (609) 753-0004 or via the Internet at tnolle@cimicorp.com.*



watch the sparks fly!  
Vicki Ebben  
Computer IS specialist  
State of Washington — Department  
of Social and Health Services  
Olympia

I note that the new offerings described in your article "Cisco cranks up Fast Token Ring" (May 26, page 1) address backbone and server links.

This fall, Gigabit Ethernet will, in all likelihood, be in full production and competing for the same customer base as 100M bit/sec token ring in a market

that is now over 80% Ethernet. Shouldn't this situation raise questions in network managers' minds as to the viability of sticking with token ring?

Token-ring technology is sound, but the market presence has dwindled to the point that it is now the Betamax of network protocols.  
Charles Urban  
Baldwin, Md.

While Kevin Tolly believes "The time is right for Fast Token Ring" (May 26, page 24), one has to wonder about this assertion and several of the assumptions he makes to justify it. He trots out the old chestnuts about how slow Ethernet is and how efficient token ring is while avoiding a few unpleasant facts.

First, private Ethernet is now priced about the same as shared token ring. In a two-node collision domain, speeds well in excess of 8M bit/sec are easily

sustainable — or double that for full-duplex Ethernet.

Second, shared Fast Ethernet is much faster than shared token ring will ever be and is also comparable in price to token ring.

Third, the upgrade to ATM that Tolly suggests as inevitable is far from certain, since switched Fast and Gigabit Ethernet seem likely to eclipse ATM for most local applications.

Folks like Tolly keep emphasizing how hard it is to change, rather than the many benefits of using the same equipment as the other 90% of the industry.

Karl Compton  
Vice president for network engineering  
Cierra Solutions, Inc.  
Houston

Tolly replies: You clearly feel token ring is dead. What is more important, though, is whether token-ring vendors have a similar assessment. They have been

strangely silent on the subject of token ring's future. On June 17, I'll be meeting with the seven major players to get their views on the situation.

Regardless, it is wrong to dis-

miss investment preservation as an issue. The idea of ripping out a fully functional and well-performing network with the goal being simply to "get with it" is ludicrous.

### Teletoons



www.nwfusion.com

Go online to read more letters about Fast Token Ring and other subjects.





**Introducing servers that  
will change the way you look  
at your current one.**



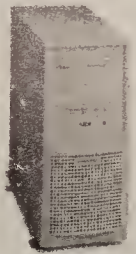
©1997 NEC Computer Systems Division, Packard Bell NEC, Inc. NEC is a registered trademark and Express5800 is a trademark of NEC Corporation, used under license by Packard Bell NEC, Inc. The Intel Inside logo and Pentium are registered trademarks of Intel Corporation. Windows and Windows NT are registered trademarks of Microsoft Corporation. NetWare and Novell are registered trademarks of Novell, Inc. in the United States and other countries. 1997 AIM Hot Iron Award: Best Throughput Performer, Domain Server Mix (Windows NT) priced less than \$7,500 and Best Price/Performance, Domain Server Mix (Windows NT) priced between \$7,500 and \$15,000. AIM Technology is the performance measurement division of Network General. All other trademarks and registered trademarks are property of their respective owners.



## The NEC Express5800™ series servers.

Once you've seen them, other servers will seem like toys by comparison. Because the Express5800 series is a complete line of expandable, scaleable, powerful and reliable servers that simply do more.

You'll find every NEC Express5800 server—from our most sophisticated to our most affordable—offers unique technology with an array of configurations broad enough to meet your needs. In fact, many of our servers offer hot-swap redundant power supplies and fans, hot-swap disks, error-correcting memory, comprehensive upgrade and expansion systems, and NEC management software.



But it's not just technology for technology's sake. Our servers, including the AIM award-winning LE2000, give you more performance for less money. Each features from one to four SMP-capable Intel Pentium® Pro processors, large capacity disks, dual I/O channels, and support for higher memory configurations. There's also RAID support and common options across models.



Most importantly, an Express5800 server connects your business to NEC, a world wide technological leader in enterprise computing. We offer complete service and support options, including on-site service, as well as a full three-year limited warranty. In addition, every Express5800 server is certified to run on Microsoft Windows NT® and Novell NetWare®.



So whether you're looking for your first server or your fiftieth, don't play around. Get an NEC Express5800. Call 1-800-456-9372, ext. 8778.

Visit our web site at [www.nec-computers.com](http://www.nec-computers.com).

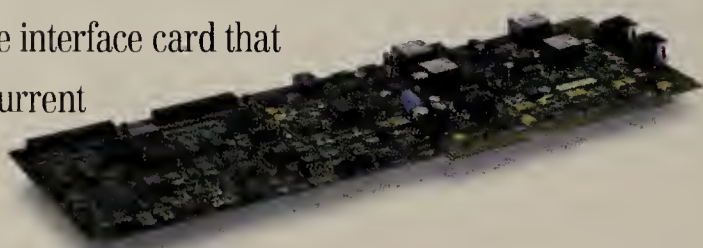
# NEC



# Introducing the phone/fax gateway that puts voice on any IP network

If you thought you had to forego the savings and efficiency of data/voice networking, we have good news for you.

V/IP is a simple voice interface card that adds voice to your current IP network.



It gives your enterprise the most cost-effective way to handle data, fax and voice communication between networked locations.

To add voice/fax capability to your current network, just plug your V/IP card into one PC in each remote site (even a 386 will

do) and connect it to your PBX. Once V/IP is installed, it's user transparent. But the savings are highly visible. No more toll charges between offices connected by V/IP-equipped WANs.

V/IP features ClearVoice G.729 compression technology for optimum bandwidth utilization.

MICOM is a Northern Telecom (NORTEL) company, and is the worldwide leader in data, voice, fax and LAN network integration.

**NORTEL**  
NORTHERN TELECOM

Call us and ask for a demonstration of ClearVoice technology.

**(800) 642-6687 Extension 1038**

[www.micom.com/ad/nw.html](http://www.micom.com/ad/nw.html)

**MICOM<sup>®</sup>**  
*The Voice of Networking<sup>™</sup>*

See us at PC Expo Booth #1335

Circle Reader Service #12



# The squeeze is on

## Functionality wins out over glitz in Network World Survey.

By Brian O'Connell

One of the most notorious half-truths of the networking industry is that it moves at a lightning pace. Some observers would have you think that no sooner are loading docks stocked with the next great cyberpanacea than an updated version of the same product is rolled out later that afternoon.

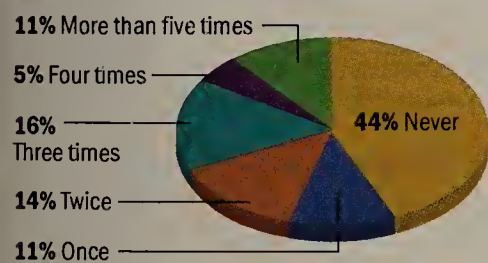
While network product developers rightfully take pride in their ability to create, package, distribute and maintain high-tech tools and services in ever-shortening production cycles, network managers are more methodical and deliberate than ever — especially when it comes to managing their budgets.

For proof, look no further than the 1997 *Network World*/Deloitte & Touche Consulting Group 1997 Budget Survey. The survey amounts to an annual reality check, a gauge to see whether industry hype translates into budget dollars. As in past years, the results this time around indicate a resounding “not really.”

Network managers continue to move at a deliberate pace in actually cutting checks for glitzy new technologies such as ATM, video and even Internet/intranet wares.

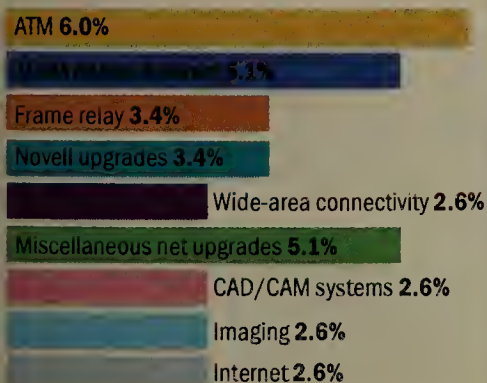
### Figure 1: HOLDING THE LINE

Respondents were asked how often they had to hold back on major expenditures during the past year.



Note: Percentages do not equal 100% because of rounding.

### Those who had to delay expenditures at least once were asked what technologies or projects were affected:



(Everything else below 2%)



BOB DALY

External factors such as mergers and acquisitions and market conditions contribute to that stance, carrying significantly more weight in determining budget levels than the lure of glamorous new technologies. For network managers, more than ever it is substance over sizzle when it comes to managing their budget dollars.

The survey, sponsored by Deloitte & Touche Consulting Group, is based on telephone interviews with 200 *Network World* readers. All respondents were responsible for specifying or approving expenditures, while 198 said they owned that responsibility on a corporate, as opposed to departmental, level. In fact, 25% said they were responsible for 20 to 100 networked sites within their organization. Another 16% said they were responsible for more than 100 such sites. Target companies had annual revenue of \$100 million or more.

“We’re acquiring companies left and

right,” says Allen Hoffman, network manager at Edina, Minn.-based US Filter Distribution group, a subsidiary of US Filter Corp. in Palm Desert, Calif. “It’s all we can do to collect the basic networking tools like e-mail to hook everybody up and get them up and running.”

Hoffman says US Filter is using frame relay to link network users over the company’s WAN, but is not in any rush to add new features, especially since the company’s buying spree may continue. “At this point, we haven’t had the time to look at ATM or Gigabit Ethernet because we’re just trying to keep up.” Indeed, the company has to tackle less glamorous chores such as upgrading its e-mail systems before it moves on to projects aimed at increasing bandwidth.

That is a recurring theme among survey respondents. Many noted that in today’s chaotic workplace environment, where

internal organizational changes are as commonplace as *Seinfeld* reruns, staying focused on one or two projects can help squeeze the most out of network budget dollars. That philosophy may be slowing the growth of grand-scale infrastructure installations within networked organizations.

“We’re not really cutting back on anything,” says Barry Tarbet, network administrator at NAL Acceptance Corp., a Fort Lauderdale, Fla.-based financial services company. “But I wouldn’t say that we’re not putting too much on our plate either.”

Tarbet is in the midst of a major AS/400 and Novell, Inc. NetWare Directory Services (NDS) installation at NAL — with full videoconferencing and Internet capabilities — and is reluctant to take his eye off that ball by getting into other projects.

“Right now, I don’t want to be juggling too many apples in the air. It’s taking us so long to convert everything to NDS that I don’t have time to think about anything else,” he says. Tarbet acknowledges that he would like to take his company’s network to frame relay but cannot justify the expense right now. “It’s a little more cost efficient, but the service and support aren’t there yet,” he says. “We’ll wait a little while on that one.”

Some say a deliberate, methodical approach to network budgeting has caused many network managers to hold off on Internet/intranet installations, at least until the technology’s security can pass muster. In fact, only 4% of the respondents said Internet/intranet funding represents their “most significant” budget increase in 1997, compared to 8.4% in 1996. Perhaps the pioneers have already played their cards and now we are seeing a more measured approach.

“Nobody wants to trust the overall business process to the Internet,” says Robert Mills, director of information technologies at Grand Rapids, Mich.-based Smith Technologies. “But the amount of data that is on the ‘Net is beyond comprehension. So we’ll plan for it accordingly, but it won’t happen overnight.”

### Bulking up on client/server tools

Questions concerning which technologies would call for significant budget increases or decreases were open-ended — respondents were not prompted in any way for a response. This was intended to garner more accurate results, but it also meant no one technology would likely receive an



balance of responses.

That said, respondents indicated the areas that will see the most significant budget increases next year include switching equipment (5.6%), WAN equipment and services (5%), voice applications (4.5%), ATM (4.0%) and Internet/intranet tools (4.0%).

"We're really looking for switching technologies and Internet gateways to mainframe applications," says Ken Rigsby, systems programmer at County of Charleston, S.C. "I think it's easier to get budgeting for projects if you adopt a long-term network

volume rates will decline significantly this year as we're disconnecting our 3090 and pushing it out the door in June."

That will make more room for the two IBM SP symmetrical chassis machines that each will hold as many as 10 Unix processors. "We're purchasing 20 to 30 stand-alone Unix systems, as well," he notes. As with so many users, all this is driving him straight to switching. "We need more switched ports and 10Base-T lines, especially since we have new groupware coming in that could use the extra boost."

Indeed, more than 40% of survey respon-

the network," he says. "I don't think that ATM is overhyped, it's just too expensive right now and Ethernet is easier to troubleshoot. Our staff is Ethernet-trained and ATM support people are in short supply. It just doesn't make sense for us right now, but it might later on."

#### On the way out

Areas that respondents said will see the most significant budget decreases next year include outsourcing/consulting services (4.6%), mainframe equipment (7.4%) and Novell networking products and services (3%). Of the three, outsourcing and Novell appear to be the hot-button issues.

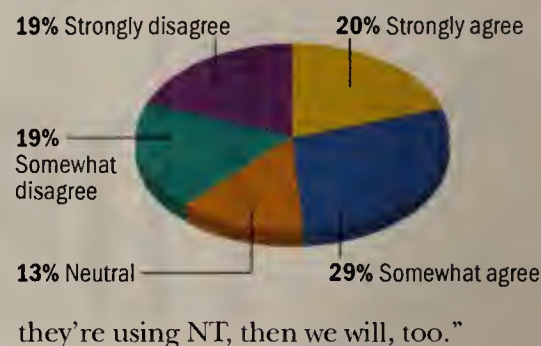
It is clear that NetWare is fast losing ground to Windows NT. "I think that Novell has a pretty serious marketing problem," says Rigsby, whose organization is one of many looking to rely more heavily on Windows NT. "Their chief problem is that [Novell] has spent too much time waffling with WordPerfect and Unix and has never delivered a consistent message to its customers."

Comments like that must make Novell smart, given that it has spent much of the past year trying to get out its Internet/intranet message. But the NT juggernaut is having a snowball effect that sometimes takes the decision out of users' hands.

Consider Donald Palmer, a systems engineer at manufacturing parts supply company Dimensions International, who says he is swapping out his Novell 3.12 net for Windows NT because of external factors. "We have a big contract with the Department of Defense," he says. "Since

#### Figure 3: FEELING THE PRESSURE

Respondents were asked to what extent they agree with the statement, "There is evidence in my company that the network department has to compete for business with external consultants, including outsourcers."



they're using NT, then we will, too."

#### Pace of approval

Rising prices for some big-ticket items are further complicating the budget picture. According to Gartner Group, Inc., a consultancy in Stamford, Conn., the price tag for local and long-distance phone rates is going up 5% in 1997 while frame relay rates will see a 10% hike.

Unfortunately, corporate financial executives continue to toss nickels around like manhole covers and senior management continues to grapple with the issue of quantifying technology's contributions to the

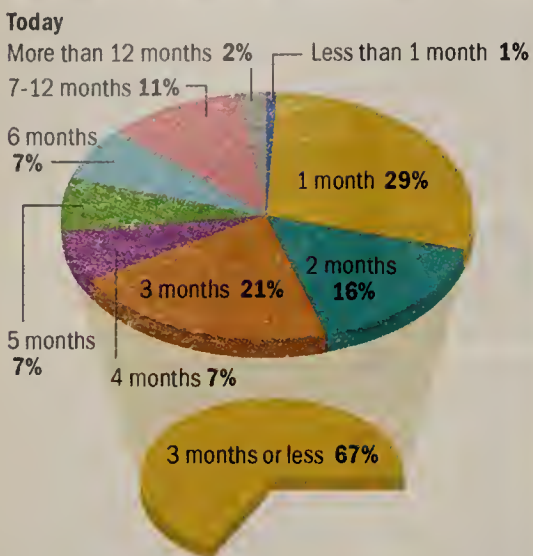
Check out our expanded Budget Survey results on Network World Fusion — more stats, facts and figures.



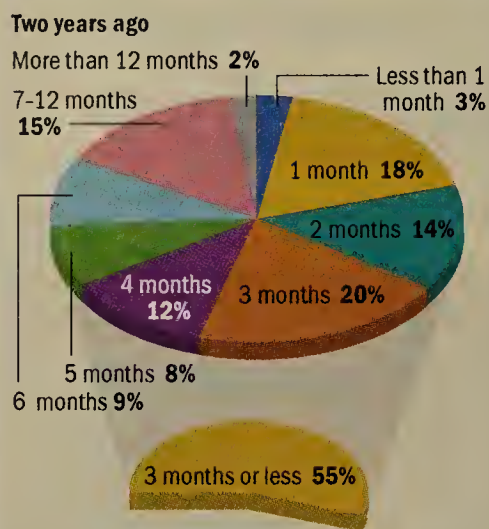
www.nwffusion.com

#### Figure 2: A SENSE OF URGENCY

If it seems like the pace of change is quickening, you're not imagining things. Respondents were asked how many months it takes to get major network expenditures approved today vs. two years ago.



Note: Percentage totals sometimes do not equal 100% because of rounding.



strategy like we did this year, where everyone signs off on it."

The migration from mainframes to client/server continues unabated and is fueling the move toward switching technologies.

Bruce Hilditch, lead networking specialist at Allina Health Systems, a Minneapolis-based health care systems provider, is in the middle of a five-year mainframe-to-client/server migration. He estimates that 60% of his organization's network traffic is from 3270 terminal emulation-based systems. "But that's continuing to change," he says. "I would expect that our mainframe

dents said they will require more network capacity by the end of 1997. Foremost among the technologies they are considering to meet that demand is switching — Fast Ethernet and, to a lesser extent, ATM.

Mark Hendrix, network manager and acting director of corporate network engineering services at Washington, D.C.-based Federal National Mortgage Association (FNMA), says his company's move to switched Ethernet gives it a better launchpad to future bandwidth options. "We're trying to convert off of older topologies, like token ring, that are harder to manage and service," he says. "Moving to switched Ethernet also gives us a nice migration path to faster technologies like Gigabit Ethernet."

ATM, on the other hand, still seems to be a source of user uncertainty. As noted, it shows up as one item for which users are planning significant budget increases, but it is also one that 6% of users said they had to back away from for lack of funding. In general, the story appears to be the same as it has been for the past couple of years: Users are still kicking the tires more than buying in droves.

"ATM is still risky right now," explains James Shipman, manager of the network engineering group at Anp, Inc., a Harrisburg, Pa.-based electronics manufacturer, "but only because of the cost of the [ATM] ports." Shipman is opting for Ethernet switching and 10Base-T cards because of the productive and affordable dedicated bandwidth he can get for his money. But that doesn't mean he isn't thinking ATM down the road.

"Look, [Ethernet switching] was just a less expensive way of adding bandwidth to

#### Deloitte & Touche Consulting Group



Deloitte & Touche Consulting Group, the sponsor of this year's Budget Survey, focuses on applying telecommunications

expertise to solving business problems. The firm's consultants are typically either business school graduates with an undergraduate focus in telecommunications, or technical people with five to 10 years of consulting experience. The firm has networking centers of expertise in 15 offices around the world.

Check out the Deloitte & Touche Consulting Group Web site for further information, including employment opportunities at the company: [www.dtcg.com](http://www.dtcg.com).

[www.nwffusion.com](http://www.nwffusion.com)

#### London School of Economics can help you make your business case

Having trouble getting approval for your latest project idea? Try throwing around some numbers from the London School of Economics (LSE).

According to a three-year study the school conducted with Compass, a London-based computer consultancy, 54% of companies surveyed said their computer networks are directly linked to increased profits. That's up 16% from 1993, Compass says. The survey, which was completed in late 1996 and released in April, is based on responses from 150 Fortune 1000 companies around the globe.

Survey results indicate that the larger the investment companies make in information technology, the larger the payoff. Finance and government sectors — the biggest spenders in the global IT market — have benefited the most from their IT installations, with 60% and 62% returns on investment (ROI) since 1993, respectively.

In country-specific terms, the Compass/LSE study estimates that Germany, the U.K. and the U.S. enjoy the highest rate of return on technology spending, with 14%, 17% and 17% of profits, respectively, tied directly to IT spending over the past three years.

The study claims companies are finding it easier to quantify ROI from IT spending because they "have stopped looking unrealistically for surefire gains [by] applying IT to existing operations and accepting the customary business risks of using IT to enable new business strategies."

The Compass/LSE study also points to a global disparity in the number of workers who use computers every day. According to the report, 67% of U.S.-based company staffers have computers on their desktops, up 17% from three years ago. In the U.K., however, the figure is only 48%. On a worldwide basis, employees in finance and retail/distribution departments use computers the most: 71% and 73%, respectively.

Electronic commerce is making significant strides in global IT circles, with 57% of all such commercial communications among companies, suppliers and customers taking place via computer. That's up 21% from three years ago, the study reports. The U.S. (63%) leads the way again, outpacing second-place U.K. by 14%.

— Brian O'Connell



# Reader Service Card

**IT'S EASY.** Circle the number on this card which corresponds to the number at the bottom of the advertisement. Mail or FAX to (413) 637-4343 today. Information will be provided to you FREE of charge.

Circle the number below which corresponds to the number at the bottom of the advertisement for more information.

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54
55	56	57	58	59	60	61	62	63
64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81
82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99
100	101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116	117
118	119	120	121	122	123	124	125	126
127	128	129	130	131	132	133	134	135
136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153
154	155	156	157	158	159	160	161	162
163	164	165	166	167	168	169	170	171
172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189
190	191	192	193	194	195	196	197	198
199	200	201	202	203	204	205	206	207
208	209	210	211	212	213	214	215	216
217	218	219	220	221	222	223	224	225
226	227	228	229	230	231	232	233	234
235	236	237	238	239	240	241	242	243
244	245	246	247	248	249	250	251	252
253	254	255	256	257	258	259	260	261
262	263	264	265	266	267	268	269	270
271	272	273	274	275	276	277	278	279
280	281	282	283	284	285	286	287	288
289	290	291	292	293	294	295	296	297
298	299	300	301	302	303	304	305	306
307	308	309	310	311	312	313	314	315
316	317	318	319	320	321	322	323	324

Please check all of the products for which you are interested in receiving FREE information.

## COMPUTERS/PERIPHERALS

- 600 ☐ Backup Devices
- 601 ☐ Cabling and Cabling Systems
- 602 ☐ Micros/PCs
- 603 ☐ Mainframes
- 604 ☐ Minis
- 605 ☐ Printers
- 606 ☐ Storage Devices
- 607 ☐ Terminals
- 608 ☐ UPS
- 609 ☐ Workstations

## SOFTWARE

- 610 ☐ Applications
- 611 ☐ Client/Server Application Development
- 612 ☐ Communication/Terminal Emulation
- 613 ☐ Computer Operating Systems
- 614 ☐ Database Management/RDBMS
- 615 ☐ E-Mail
- 616 ☐ Groupware
- 617 ☐ LAN Operating Systems
- 618 ☐ Network Diagramming
- 619 ☐ Network Management
- 620 ☐ Security
- 621 ☐ Suites
- 622 ☐ Systems Management

## INTERNETWORKING

- 623 ☐ Bridges
- 624 ☐ Routers
- 625 ☐ Gateways

## LOCAL AREA NETWORKS

- 626 ☐ ATM Switches
- 627 ☐ Ethernet Switches
- 628 ☐ Fax Servers
- 629 ☐ Hubs/Intelligent Hubs
- 630 ☐ LAN Servers
- 631 ☐ Local Area Networks
- 632 ☐ Network Adapter Boards/NICs

- 633 ☐ Peer-to-Peer LANs
- 634 ☐ Print Servers
- 635 ☐ Remote LAN Access

- 636 ☐ Remote Access/Communication Servers
- 660 ☐ Security
- 636 ☐ SNMP Network Management
- 661 ☐ Storage
- 637 ☐ Superservers
- 638 ☐ Wireless Networks

## REMOTE/WIRELESS COMPUTING

- 639 ☐ Laptops, Notebooks
- 640 ☐ PCMCIA
- 641 ☐ Mobile Data Equipment and Services
- 642 ☐ Wireless Data Equipment and Services

## WAN EQUIPMENT AND SERVICES

- 643 ☐ ATM
- 644 ☐ CIT (Computer Integrated Telephony)
- 645 ☐ Diagnostic, Monitoring and Test Equipment
- 646 ☐ DSU/CSU
- 647 ☐ E-Mail/Dn-Line Services
- 648 ☐ FAX Boards/Modems
- 649 ☐ Fiber Optics
- 650 ☐ Frame Relay
- 651 ☐ ISDN
- 652 ☐ Modems
- 653 ☐ PBX
- 662 ☐ Security
- 654 ☐ SMDS
- 655 ☐ T1, T3, Fractional T1 Mux and Services

- 656 ☐ Videoconferencing/Teleconferencing
- 657 ☐ WATS/MTS

## INTERNET/ELECTRONIC COMMERCE

- 658 ☐ Internet Access Providers/Services
- 659 ☐ Firewalls
- 660 ☐ Web Servers
- 661 ☐ Internet Software Tools

## OTHER

- 662 ☐ Education and Training
- 663 ☐ Storage Cabinets/Furniture

# NetworkWorld

ISSUE DATE 06/16/97

CARD MUST BE RECEIVED BY 09/16/97

NAME

TITLE

COMPANY

STREET

CITY/STATE/ZIP

PHONE

FAX

E-MAIL ADDRESS

FILL OUT, DETACH AND MAIL

Now it's easy to find valuable information on the latest products and services with *Network World's* Reader Service Card - FREE!

FILL OUT, DETACH AND MAIL

# Reader Service Card

**IT'S EASY.** Circle the number on this card which corresponds to the number at the bottom of the advertisement. Mail or FAX to (413) 637-4343 today. Information will be provided to you FREE of charge.

Circle the number below which corresponds to the number at the bottom of the advertisement for more information.

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54
55	56	57	58	59	60	61	62	63
64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81
82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99
100	101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116	117
118	119	120	121	122	123	124	125	126
127	128	129	130	131	132	133	134	135
136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153
154	155	156	157	158	159	160	161	162
163	164	165	166	167	168	169	170	171
172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189
190	191	192	193	194	195	196	197	198
199	200	201	202	203	204	205	206	207
208	209	210	211	212	213	214	215	216
217	218	219	220	221	222	223	224	225
226	227	228	229	230	231	232	233	234
235	236	237	238	239	240	241	242	243
244	245	246	247	248	249	250	251	252
253	254	255	256	257	258	259	260	261
262	263	264	265	266	267	268	269	270
271	272	273	274	275	276	277	278	279
280	281	282	283	284	285	286	287	288
289	290	291	292	293	294	295	296	297
298	299	300	301	302	303	304	305	306
307	308	309	310	311	312	313	314	315
316	317	318	319	320	321	322	323	324

Please check all of the products for which you are interested in receiving FREE information.

## COMPUTERS/PERIPHERALS

- 600 ☐ Backup Devices
- 601 ☐ Cabling and Cabling Systems
- 602 ☐ Micros/PCs
- 603 ☐ Mainframes
- 604 ☐ Minis
- 605 ☐ Printers
- 606 ☐ Storage Devices
- 607 ☐ Terminals
- 608 ☐ UPS
- 609 ☐ Workstations

## SOFTWARE

- 610 ☐ Applications
- 611 ☐ Client/Server Application Development
- 612 ☐ Communication/Terminal Emulation
- 613 ☐ Computer Operating Systems
- 614 ☐ Database Management/RDBMS
- 615 ☐ E-Mail
- 616 ☐ Groupware
- 617 ☐ LAN Operating Systems
- 618 ☐ Network Diagramming
- 619 ☐ Network Management
- 620 ☐ Security
- 621 ☐ Suites
- 622 ☐ Systems Management

## INTERNETWORKING

- 623 ☐ Bridges
- 624 ☐ Routers
- 625 ☐ Gateways

## LOCAL AREA NETWORKS

- 626 ☐ ATM Switches
- 627 ☐ Ethernet Switches
- 628 ☐ Fax Servers
- 629 ☐ Hubs/Intelligent Hubs
- 630 ☐ LAN Servers
- 631 ☐ Local Area Networks
- 632 ☐ Network Adapter Boards/NICs

- 633 ☐ Peer-to-Peer LANs
- 634 ☐ Print Servers
- 635 ☐ Remote LAN Access

- 635 ☐ Remote Access/Communication Servers
- 660 ☐ Security
- 636 ☐ SNMP Network Management
- 661 ☐ Storage
- 637 ☐ Superservers
- 638 ☐ Wireless Networks

## REMOTE/WIRELESS COMPUTING

- 639 ☐ Laptops, Notebooks
- 640 ☐ PCMCIA
- 641 ☐ Mobile Data Equipment and Services
- 642 ☐ Wireless Data Equipment and Services

## WAN EQUIPMENT AND SERVICES

- 643 ☐ ATM
- 644 ☐ CIT (Computer Integrated Telephony)
- 645 ☐ Diagnostic, Monitoring and Test Equipment
- 646 ☐ DSU/CSU
- 647 ☐ E-Mail/Dn-Line Services
- 648 ☐ FAX Boards/Modems
- 649 ☐ Fiber Optics
- 650 ☐ Frame Relay
- 651 ☐ ISDN
- 652 ☐ Modems
- 653 ☐ PBX
- 662 ☐ Security
- 654 ☐ SMDS
- 655 ☐ T1, T3, Fractional T1 Mux and Services

- 656 ☐ Videoconferencing/Teleconferencing
- 657 ☐ WATS/MTS

## INTERNET/ELECTRONIC COMMERCE

- 658 ☐ Internet Access Providers/Services
- 659 ☐ Firewalls
- 660 ☐ Web Servers
- 661 ☐ Internet Software Tools

## OTHER

- 662 ☐ Education and Training
- 663 ☐ Storage Cabinets/Furniture

ISSUE DATE 06/16/97

CARD MUST BE RECEIVED BY 09/16/97



Pass this card along to a colleague so they, too, can get valuable product information FREE.

NAME

TITLE

COMPANY

STREET

CITY/STATE/ZIP

PHONE

FAX

E-MAIL ADDRESS



**FREE Product Info**

**BUSINESS REPLY MAIL**

FIRST CLASS MAIL PERMIT NO. 716 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

# NetworkWorld

PO BOX 5090  
PITTSFIELD MA 01203-9838



**Your resource for  
enterprise network  
computing information.**

**FREE Product Info**

**BUSINESS REPLY MAIL**

FIRST CLASS MAIL PERMIT NO. 716 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

# NetworkWorld

PO BOX 5090  
PITTSFIELD MA 01203-9838



**FREE Product Info**



# Introducing Instant RAS

Need instant, cost-effective remote access? Just add Netaccess Instant RAS™ MultiPort Modem (MPM) cards to your Windows NT® or Novell® NetWare® based server. You'll get an uncomplicated, flexible, open systems remote access solution. The MPM card supports either 4 or 8 modems on a single board – without all the external modems, additional cables and installation clutter that drive you crazy.

**BEST** OF  
**LAN TIMES**  
▼ 1996 ▼

## The RAS Compactor for Open Systems.

### Instant RAS MultiPort Modems offer:

- ⊙ V.34/33.6 Kbps
- ⊙ V.42 compression
- ⊙ Fax and security software compatibility
- ⊙ International support

Compacting up to 8 modems into an integrated architecture makes installation and management a snap. And up to 8 MPMs, or a combination of Netaccess ISDN Quad BRI or PRI boards, can be seamlessly integrated into your NT or Novell server.

Our MPM and Instant ISDN products are proven performers. They're integrated into the products of 5 of the top 10 vendors of proprietary remote access solutions. And now they're available for NT and NetWare.

For open remote access solutions based on standard platforms, think Instant RAS. Call Netaccess. **1-800-950-ISDN.**



**Smart Buyers Insist on  
Certified Products**



**[www.netacc.com/opensolutions](http://www.netacc.com/opensolutions)**

© 1997 Netaccess, Inc. All rights reserved. Netaccess and Instant ISDN Software are trademarks of Xircom, Inc. Instant RAS is a trademark of Netaccess, Inc. All other trademarks are the property of their respective holders.

Netaccess, Inc., 18 Keewaydin Drive, Salem, NH 03079  
Voice: 603-898-1800



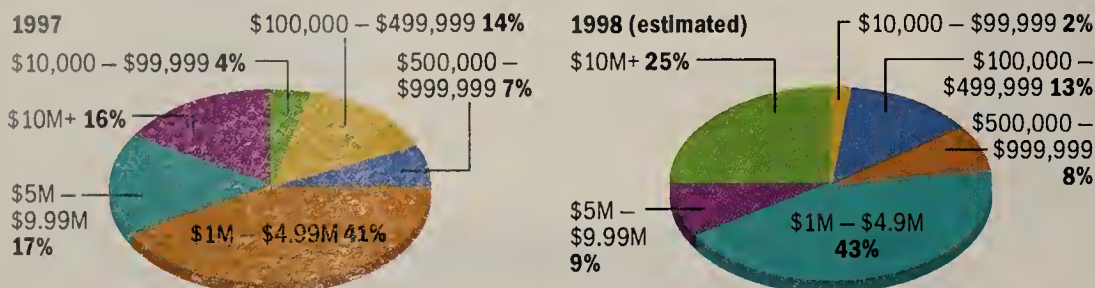
corporate bottom line.

"Getting approval is taking longer than I can remember," says Hoffman. "I think network managers have more influence on our budgets these days. But in our case anyway, the final decision is made by our CIO."

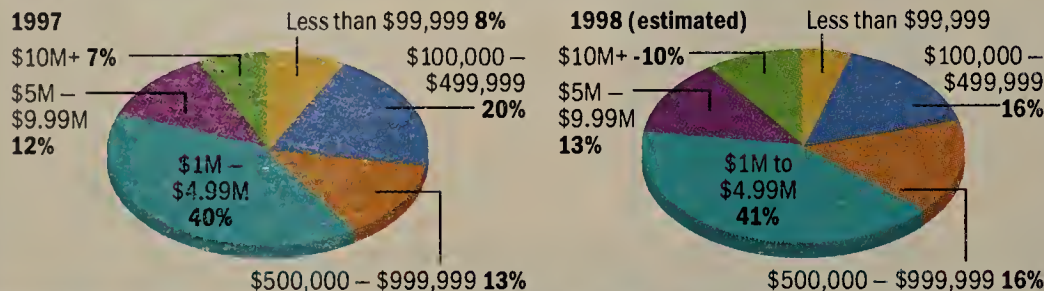
Hoffman's experience is a bit out of the ordinary in at least one respect: the pace of decision making. Survey results show that

#### Figure 4: THE BUDGET BREAKDOWNS

A look at operating budgets for this year vs. estimates for next year show a modest expectation for budget increases, with 77% expecting to spend \$1 million or more in '98, vs. 74% spending that much this year.



It's a similar picture when it comes to equipment and software, with 59% of respondents spending \$1 million or more this year and 64% expecting to spend that much next year.



Note: Percentage totals sometimes do not equal 100% because of rounding.

67% of respondents now get major network expenditures approved in three months or less; only 55% said they got things rolling that fast two years ago (see Figure 2).

On the other hand, more than 29% said they were forced to hold off on IS purchases two or three times in 1996, while 15% had between four and 20 instances when spending for large networking tools was unceremoniously cut off.

"A lot of that was indecision on what to throw our money at," says one computer specialist at the U.S. Bureau of Labor Statistics, who requested anonymity. "Some areas like ISDN and remote communications deserve more funding, but it's getting hard to build a consensus within the organization."

### Survey methodology

The Network World/Deloitte & Touche Consulting Group 1997 Budget Survey was based on telephone interviews with 200 Network World readers. Respondents were pulled from a random list of readers whose network equipment and services budgets are at least \$1 million per year and whose company revenue is at least \$100 million per year. Surveys were conducted only with subjects who indicated they are responsible for specifying or approving expenditures in network equipment, software and services.

The interviews were conducted in March and April by Focus Data, Inc. of Framingham, Mass., under the direction of the company's president, Mona Dabbon.

Of those projects that were delayed or slashed outright, most fell into the realm of network infrastructure upgrades. Nearly 20% of respondents cited network upgrades — in the form of Internet/intranet installations or routing and switching add-ons — as capital expenditures that had to be shelved. As noted above, 6% said they had to hold off on ATM projects, while 5% cited

100M bit/sec Ethernet. Other technologies that felt the budget knife were frame relay (3.4%) and imaging (2.6%).

The numbers and follow-up interviews indicate it is virtually impossible to seed major new projects such as infrastructure and Internet ventures at the same time. Something usually gives.

"We're adding \$6.25 million worth of new network infrastructure upgrades," says Joe Drees, network engineer at the University of Toledo. "We're completely rebuilding our network by putting millions of dollars into fiber cabling and Cisco [Systems, Inc.] products. That's replacing our old broadband network whose time had come and gone."

That expenditure left little room for Drees to beef up his network's Internet capabilities, also a top priority at the university. "We are looking to upgrade our T-1 feed to the Internet to T-3," he says. "But we're finding it hard to budget for that. The network upgrade is one factor, and another is that budgeting for the Internet is not a one-time capital event."

To hurdle that barrier and get his organization the Internet add-on it needs, Drees has had to be creative financially. "What we're doing is putting the expense in as a recurring item, which is still difficult, but at least helps us build a better case for adding T-3 for the campus."

Still, 44% of respondents said they did not have to hold off on any budgeted projects, which indicates there are plenty of folks who did not run into complications. "I think people are finally getting smarter in planning their IT budgets," says Smith Technology's Mills. "You've got to lead the target so that you're a year ahead of where you want to be. That's why there are fewer delays."

In fact, a study completed by the META Group, Inc. consultancy in December 1996 says 65% of IT budgets will rise in the next 18 months, compared to 53% six months earlier. Service-related industries should benefit the most, according to META, with financial services leading the pack. Of the companies in this area, 70% said they will see increased budgets. Manufacturing will take the biggest outlay hit, with only 20% of companies saying their IT budgets will rise in the next year-and-a-half, compared to 54% six months earlier.

#### Dialing for dollars

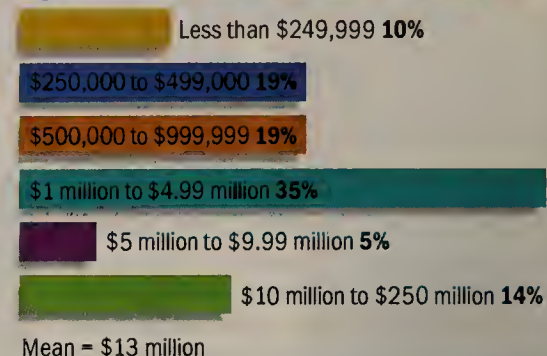
But if budgets are rising, they're not rising by much. The number of survey respondents who have operating budgets in the \$1 million to \$5 million range will grow incrementally from 41.2% in 1997 to 43% in 1998. At higher levels, however, growth should accelerate more substantially.

Only 16.4% of study participants categorized themselves as having network operating budgets of \$10 million or more in 1997. But optimism reigns supreme: For 1998, 25.2% estimate their budgets will rise to \$10 million or more, with 2.5% anticipating that their budgets will skyrocket to more than \$100 million (see Figure 4).

"When some of these newer technologies mature, they'll likely fit better into our budget plans and we can target more funding to them," explains the source at the U.S. Bureau of Labor Statistics. "Things like remote computing and ISDN aren't something you'd want to throw money at now, but are things that we are looking to fund more heavily in the future."

Nobody is thumping their chests and crowing that network budgeting in the hurly-burly world of corporate telecom-

#### Figure 5: TOTAL SALARY BUDGET LINE FOR 1997



71% of respondents said it increased. Expectations were roughly the same for 1998.

9% of respondents said the salary line item decreased in 1997 vs. 1996.

Note: Percentage totals sometimes do not equal 100% because of rounding.

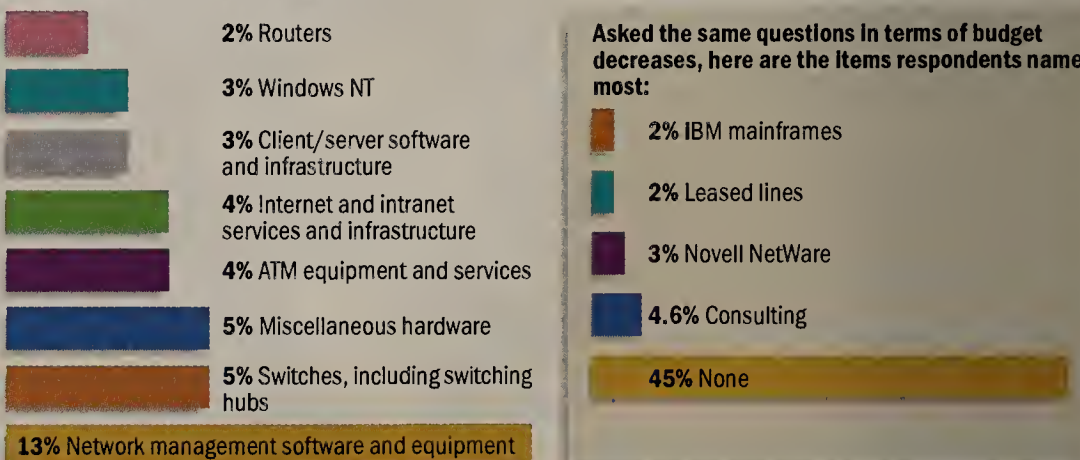
spending today is going toward places like hubs, routers and switches, that may not require that kind of capital expenditure tomorrow. In technology, everything changes hourly. So everything we purchase is designed to fit into our network for years to come without significant additional outlays down the road," explains James Freuck, network engineering supervisor at Milwaukee-based Aurora Systems.

Down the road may just mean more high-profile technologies such as ATM, voice and video, and full-blown Internet and intranet installations. But until then, the thinking on the part of some network managers is that these technologies represent more of a luxury than a necessity. Until the pendulum begins to swing the other way — and most think it will — corporate pocketbooks will be restrained accordingly.

O'Connell is a freelance writer in Framingham, Mass. He can be reached at [bwrite111@aol.com](mailto:bwrite111@aol.com).

#### Figure 6: WHERE THE EXTRA MONEY'S GOING

Respondents were asked for which types of products, services and network software they were expecting the most significant budget increases this year vs. last year. Given that it was an open-ended question, meaning respondents were not prompted on how to answer, it's not surprising that answers were varied and no one technology garnered a large response.

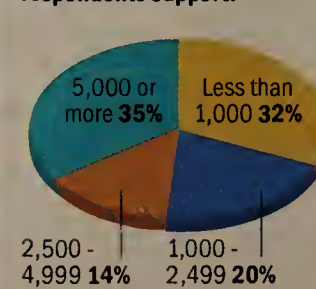


munications is easy. Now more than ever, creating a formula for budget forecasting is a collaborative process comprising users, MIS staffers and senior managers. The key to that formula is spending enough on network tools and services to ensure that operating costs remain low and organizational productivity remains high.

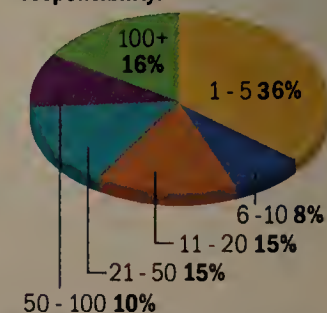
"The money that we're

#### Figure 7: RESPONDENT PROFILE

Number of end users respondents support:



Total number of sites for which respondents have budgetary responsibility:



Note: Percentage totals sometimes do not equal 100% because of rounding.



# Big iron for NFS

*A trio of NFS servers, all well-rated, serve distinct market niches.*

By Christopher Caldwell

If you're using Unix as an application server, chances are you're using Network File System (NFS) as a way to share files over the network. But if you don't have at least one server dedicated to handling NFS functions, chances are you're sacrificing performance.

We looked at three leading NFS servers. If you want lots of functionality, Invincible Technologies Corp.'s Lifeline offers a full Unix host in addition to providing NFS.

This is a double-edged sword, though, because Unix hosts tend to be more complex to administer and employing the server for other purposes could decrease its stability as an NFS server.

Nonetheless, the Lifeline captured our Blue Ribbon, albeit by the slimmest of margins.

Network Appliance, Inc.'s NetApp F540 was best for a midsize NFS server, thanks to the ease with which it can be installed and configured. Falcon Systems, Inc.'s FastfilePro is the best package for larger environments because the company offers a smooth upgrade path from small- to large-volume networks.

(We also invited Auspex Systems, Inc. to participate, but the company declined. It

said that our tests, which emphasized manageability and stability issues more than trying to swamp each box with a large, parallel load, would be unable to showcase the product's high performance.)

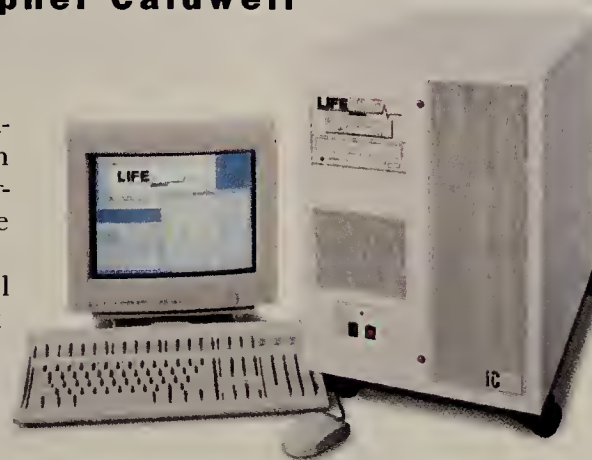
Invincible's Lifeline is a Digital Equipment Corp. Alpha-based Unix box with a 20G-byte Digital StorageWorks disk array bundled with a companion RAID administration tool called Management, Environmental and Diagnostic Subsystem (MEDS).

The machine comes with the operating system installed on a logical disk volume on the disk subsystem. You must create other logical disk volumes for your data. It also comes with a modem setup to allow Invincible engineers to diagnose problems.

Lifeline is less expensive than the other machines we tested. But it can be a good low-end NFS server alternative thanks to its easy configuration and administration.

Network Appliance's F540, like Falcon's FastfilePro, runs a proprietary operating system on a custom-made platform connected to a 30G-byte Digital StorageWorks disk array.

Falcon's Fastfile Pro is an imposing black cabinet that comprises a PC with a 60 G-byte RAID subsystem. Rather than DOS



Invincible's Lifeline is not just an NFS server — it is a complete Unix host.

or Unix, however, the PC runs the company's AerREAL operating system, which facilitates the product's hardware performance acceleration.

#### Admirable performance, questionable alarms

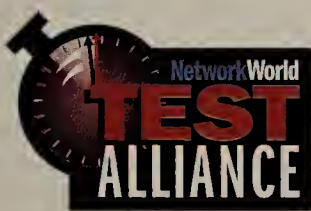
All of the machines were able to handle NFS transactions faster than we would have been able to stress them without several hundred NFS clients accessing files at once. Therefore, we zeroed in on testing the way

these machines handled discrete sequential requests. Because this measure does not completely reflect the machines' full capabilities, we did not include performance in our scorecard ratings.

We found that the Falcon and Network Appliance servers were able to handle a stream of requests about twice as fast as Lifeline, especially in cases in which we were performing lots of atomic operations — operations that must finish before the next can begin, such as creating symbolic links.

To test each server's ability to handle hardware failures, we removed one of the hot-swappable disks in each unit while using NFS to write data to the drives.

We were hoping each machine would make it obvious that something had gone wrong immediately and continue to operate seamlessly while it repaired the problem.



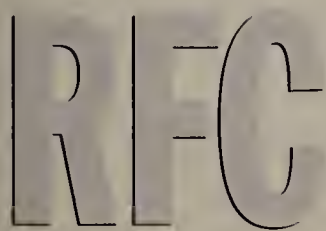
## ScoreCard

### Overall score

	Lifeline server 7.9	NetApp F540 server 7.8	FastfilePro server 7.2
Ease of services configuration (25%)	9	9	5
Reliability (20%)	7	8	7
Ease of hardware configuration (15%)	9	7	10
Scalability (15%)	5	8	9
Performance monitoring (15%)	9	7	8
Installation (5%)	8	6	4
Documentation (5%)	7	7	6

## NetResults

Product	Lifeline	NetApp F540	FastfilePro
Vendor	Invincible Technologies Corp. (508)533-3099 www.invincible.com/lifeline.htm	Network Appliance, Inc. (415)428-5100 www.netapp.com/products/level3/F540.html	Falcon Systems, Inc. (800)782-2330 www.falcons.com/falcon/NFSOverview.html
Price	\$45,295	\$118,955	\$116,900
Pros	<ul style="list-style-type: none"> <li>True Unix OS makes adding functionality easy</li> <li>GUI is well thought out and intuitive</li> </ul>	<ul style="list-style-type: none"> <li>Easy to add disks on the fly</li> <li>Easy to configure file trees and permissions</li> </ul>	<ul style="list-style-type: none"> <li>Highly expandable</li> <li>Well suited for rack-based machine rooms</li> </ul>
Cons	<ul style="list-style-type: none"> <li>GUI does not handle unexpected errors well</li> <li>Unix OS may tempt you to use machine as compute server</li> </ul>	<ul style="list-style-type: none"> <li>Terminal not supplied</li> </ul>	<ul style="list-style-type: none"> <li>Software revisions changing quickly</li> </ul>



### Request for Comment

We're planning a comparative look at Web authoring tools in an upcoming issue. Which do you find outstanding?

We'll round up some of our readers' favorites for review.



Only the Network Appliance unit performed as expected.

The Falcon gave no obvious indication that anything was wrong. After a while, it became obvious to us that it had not noticed.

We kept removing drives until it generated a cryptic message and the "view log" option on the main screen started to blink. Choosing that option revealed that indeed the disks had been failing.

The log viewer indicated there was an alarm on, but we couldn't hear it, even though the volume was at an adequate level.

We then put the drive back in and told the system to rebuild it, which it did. After discussion with the vendor, we determined that the server probably didn't generate an error message because its 256M-byte cache was so big it hadn't had to write data to the disk yet.

As soon as it did, the software detected the failed hardware and printed the error message.

Like Falcon, Lifeline gave no audible alarm and continued to operate normally. After hunting around through the MEDS screens, we found one indicating that a critical error had happened. We could not find a way to have the system send e-mail or generate a more noticeable failure indication. After replacing the drive, the error went away. The machine rebuilt itself, logged its progress and made its status visible in the status window.

When Network Appliance's F540 detected the problem, it printed an error message on the screen, self-tested the other devices, sent us e-mail indicating that its hardware configuration had changed, then continued its normal operation.

It was unavailable to clients while it tested itself. But because NFS is stateless and simply waits until the service becomes available, most clients would not have been adversely affected.

## Scalability

Each of these machines can be expanded to meet the needs of a growing organization.

We looked at each to see what options

they provide for increasing the following:

- Storage — number of RAID controllers and number and size of disks
- Cache memory for disk or Ethernet buffers
- Network interfaces

The Lifeline server we tested came with eight bays for disk drives of up to 4G bytes each, controlled by a special PCI-based Fast/Wide SCSI RAID controller.



*Network Appliance's F540 is an easy-to-manage midrange NFS server.*

You can configure the system with as much as 512M bytes of memory and 32M bytes of write-back cache for the RAID array.

Lifeline will support 1G-byte of main memory and as much as 648G bytes of raw storage, which comes to somewhat less usable storage depending on how you configure RAID. You can configure it with one or two network controllers, mixing and matching single- or quad-port 10Base-T or 100Base-T, FDDI and ATM. Our configuration used single 10Base-T adapters.

Network Appliance's F540 has a seven-slot PCI bus, which you can populate with cards for Dual Channel Differential Fast/Wide SCSI adapters for shelves (seven disks per shelf). The maximum raw data is 52 4G-byte disks for slightly more than 200G bytes. The machine can house as much as 256M bytes of main memory.

Network adapter options, which also take the form of PCI adapters, include single- and quad-10Base-T and 100Base-T, twisted-pair or fiber FDDI and ATM.

The Falcon FastfilePro we tested came with three shelves, each containing seven drives.

However, to add more, we would have needed to add another cabinet. The unit is based

around a PCI-bus machine. Each RAID controller takes up one slot, but the controller can contain multiple SCSI adapters.

The exact number depends on how many slots are taken up by network adapters. The Wide SCSI adapters that come standard with the machine can handle as many as 15 disks.

The maximum configuration Falcon will support with this basic chassis is 2.5 terabytes with RAID 5 and three global spare disks.

This is a hardware constraint, taking into account the number of controllers and size of each disk; the software can handle file systems of as much as 1,000 terabytes.

The machine can house as much as 256M bytes of main memory.

Falcon provides 10Base-T, 100Base-T and FDDI network adapters. Ours came

with 10Base-T. You can add as many adapters as slots are available.

## Backing the machine up

Of all the machines on your network, NFS servers are likely to be among the most important to back up.

They'll have the most data, the most important data (because of the fault tolerance) and the data that probably changes most quickly (because of the fast access).

None of the machines we tested came with a tape drive, so in each case, we had to back up the devices over the network to an 8mm drive connected to a SPARCstation-10.

However, each of the machines has a procedure for local backup you can use if you buy a tape drive with your unit.

Because Lifeline is based on a complete version of Unix, we could use any number of remote backup techniques.

We used the Unix dump utility with a remote tape drive.

We got a sustained backup rate of about 1M byte/min. Digital Unix is a popular version of Unix, and many backup suites exist for it.

Even though it doesn't run Unix, Network Appliance FastfilePro has a built-in dump command that supports remote tape drives. It also understands the rsh protocol.

This lets automatic backup scripts running on another machine execute the rsh command and tell the FastfilePro to execute an rdump command, making the unit back itself up to a remote drive.

This makes it easy to add this machine to backup technologies that have hooks for using operating system remote backup, such as Peripheral Devices Corp.'s Budtool.

We got about 1M byte/min. In the case of the Falcon, we simply used tar, the Unix tape archive command, to create a backup from a remote client.

We couldn't find a command that would generate any of the Unix standard remote tape protocols such as Remote Tape Protocol (RMT).

Because the backups were conducted over NFS (rather than the more efficient RMT protocol), they were slower than if the server supported a TCP-based remote backup facility.

We were able to backup about 0.2M byte/min with large files. Clearly, that number would be smaller with smaller files.

## Setting up for HTTP services

Although there seem to be few performance advantages to doing so, all of these NFS server vendors are now putting limited Web servers on their machines. This allows administrators to make huge amounts of data available to the browsing community, as well.

This process is simple for the FastfilePro and F540, but HTTP support is limited to file GETs. Because Lifeline runs a full version of Unix, you can install a variety of

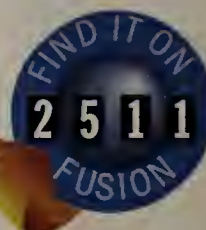
third-party Web servers on it.

We compiled and installed the Apache public domain server on Lifeline as easily as we've installed it anywhere. Because it was a full server, it was far more functional than those running on the Falcon and Network Appliance servers; the trade-off was a lot more work to get it running.

Falcon's Web server has one notable gotcha: It follows the HTTP specification to the letter.

Unlike any other server we've worked with, if you test it by making a telnet connection to port 80, it won't respond until

**For Standard Performance Evaluation Corp.'s System File Server (SPEC SFS) benchmark results on these and other NFS servers, turn to [www.specbench.org/osg/sfs93/results/res96q3/](http://www.specbench.org/osg/sfs93/results/res96q3/).**



[www.nwfusion.com](http://www.nwfusion.com)

you send it a return and a line feed. However, if your client follows the HTTP spec, it works fine.

## Nice features

Besides specific utilities, each product has some unique benefits. In some cases, what the vendor considers a feature (it runs Unix), you might consider a problem (it has to run Unix).

Because the Lifeline runs a full Unix operating system, people might try to log on to the machine. And unless you actively prevent it — as you should — local users could contribute to performance problems and perhaps instability.

However, if it is well administered, you can use the machine for more than just NFS.

For instance, it would be easy to set this machine up as an FTP server or a Wide-Area Information Server engine.

The Unix application for configuring the machine is well designed and easy to understand. But be careful:

When you try to do something other than what the Lifeline was built for, you're on your own.

We could find no compelling architectural or performance difference between using Lifeline as an NFS server and using any other common Unix platforms with RAID support.

The product's main selling point is its MEDS interface. Everything that you would normally want to do with a big NFS server is done from this application. Great care was put into providing a good graphical interface to important functions. For example, MEDS can graph the temperature on the CPU and in the disk chamber, show array I/O rates and allow you to completely configure the machine from a remote X Window terminal.

Instead of forcing users to learn RAID technology, Network Appliance has the attitude that an array should look like one big reliable disk and avoids most configuration issues entirely. If you want to expand it, in most cases, you just add another disk and the file system automati-

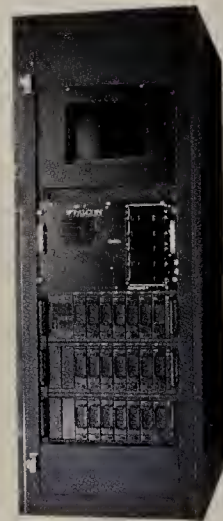
## HOW WE DID IT

We installed each server on our test network, then configured all available disk space for RAID 5. We configured and tested the servers handling different types of Network File Systems as well as some basic HTTP requests.

To test how these machines might act under load, we configured a SPARCstation-10 to:

- Time the copy of several 1M-byte files to each server
- Time the copy of a 50M-byte file to each server
- Execute a program that performed many atomic operations on a few files

To test each system's stability and fault tolerance, we unplugged a hot-swappable disk. We also used vendor-recommended procedures to back up each system.



*Falcon's Fastfile Pro comprises high-end hardware in an imposing black box with built-in keyboard and monitor.*





1. RemoteServ/IS\*. Simple name. Easier to remember than LoadBalancedClusteredRemoteApplicationServer.
2. Total uptime. Fault tolerant hardware, clustering software. If it were any more bulletproof, SWAT teams would trade in their flak jackets for this bigboy.
3. Fast remote access via dialup.
4. Fast remote access via LAN/WAN.
5. Fast remote access via Internet.
6. Fast interplanetary access we left to NASA.
7. Windows NT® Magazine says, "RemoteServ/IS is a superb combination of hardware and software, a must for the network administrator seeking remote-access functionality, with security and availability."  
We modestly, humbly, and deservedly blush.
8. Worry free. Double-Dual SMP. Managed very easily.  
Hard to describe but easy to rhyme. Just call **800-953-0143** anytime.\*

*\*Our apologies to Mother Goose, rappers and English teachers everywhere*



Cubix Corporation, 2800 Lockheed Way, Carson City, NV 89706-0719 USA Tel (702) 888-1000 Fax (702) 888-1001  
Cubix Corporation Europe Ltd., One Hunter Road, Kirkton South, Livingston, Scotland EH54 7DH  
Tel (44) 01506 465065 Fax (44) 01506 465430 France Tel 05908114 Germany Tel 0130815193

All product names mentioned are trademarks or registered trademarks of their respective owners.



ically encompasses it.

The operating system provides various ways of imposing quotas on directory sub-structures; it's all one tree from the operator's point of view.

The Falcon FastfilePro we received was

the most "machine room friendly." It contains its own rack and has a built-in keyboard and monitor. The LEDs on the disk drives not only give activity status, but also indicate their status and SCSI ID.

If you want to administer a machine

using the X Window protocol, turn to Invincible's Lifeline Server.

If you need to be able to allocate quotas for individual users, you'll want Network Appliance's F540. If you need to pack terabytes into your machine room, try

Falcon's FastfilePro.

#### Installation

Setting up any of these products is not too complex. Lifeline is a desk-side unit with a PC monitor and keyboard.

After we logged on as root, we invoked the MEDS configuration manager to configure the network and set up the RAID array.

The program is easy to understand, especially if you have used RAID before. The machine came preconfigured with RAID for the system's boot disk. We configured a second array with the rest of the disks and created a new file system on it in about 50 minutes.

The Network Appliance F540 arrived in three rack-mountable pieces: the appliance itself and two StorageWorks shelves. It was the most complex hardware to set up because it came as shelf-mountable pieces.

The device does not come with a monitor or keyboard, but all you need is a serial cable and a dumb terminal. Installation time was about 40 minutes, and software setup was easy.

The Falcon's 6-foot-tall cabinet houses the server, a monitor, a keyboard tray and several rack-mounted drive cages.

The disks are easy to insert and lock securely in place with a key. After installing the hardware, we set the machine's IP address, configured the drives as a RAID 5 virtual drive and opened it up for NFS. The whole process took only about 50 minutes.

#### Documentation

Describing the way these components should work together is the job of the documentation. Invincible's documentation advantage comes from the simplicity of its MEDS operation.

You simply don't need a lot of documentation, although Invincible's was good at describing what the different levels of RAID were used for and the drawbacks of each. A significant drawback was its lack of an index.

We ended up referring to the Network Appliance documentation more often because hardware installation was a bit trickier (the machine, intended to be installed on the customer's rack, shipped in more pieces).

The documentation was certainly up to the job.

Falcon provides two flavors of documentation: quick setup and complete. The quick setup is all you need to get the machine running in its standard configuration.

However, configuring the machine for different kinds of RAID requires intimate knowledge of the DOS-based configuration programs, making the process more painful than on other systems.

Fortunately, the documentation is more than sufficient for accomplishing the task.

*Caldwell is a member of the Net Daemons Associates, Inc. Emergency Response Team and has been responsible for technology planning and server implementation at NDA and many of its clients' sites. He can be reached at chris@nda.com.*

## TELECOMMUTING & Home Office

### EXPOSITION & CONFERENCE

October 15-17, 1997

Moscone Convention Center

San Francisco, CA

## Corporate Solutions Through Remote Access

Virtual Offices... Remote Business Locations... Work-at-Home Employees... they're all part of a movement that's reshaping the American workplace. By the year 2000, this shift of the workforce will be 55 million workers strong.

Productivity-enhancing technology Telecommuting & Home Office Exposition & Conference offers you the solutions, strategies and products to make this monumental shift possible. You'll see:

- remote access technology
- networking & telecommunications equipment
- internet access providers
- computer hardware & software
- products & services for remote offices
- financial, legal, insurance & management consulting services

An educational, business-to-business environment

If you're an executive or network manager or facilities manager charged with telecommuting your department, or a current telecommuter or home office worker, Telecommuting & Home Office Exposition & Conference is a must-attend event for you! The conference provides pragmatic tips on costs vs. benefits of telecommuting, technology trends, human resource issues, and more. Corporate case studies and insights from successful home-based workers round out the program.

Sponsored by:

**PC WORLD**  
**Macworld**

**Forbes**  
**Forbes**

Mobile Office Vehicles

**Steelcase**

**IDC/LINK**

**FAST COMPANY**

**MOBILE OFFICE ASSOCIATION, INC.**

**Vendors' ISDN Association**

**TELECOMMUTING & HOME OFFICE EXPOSITION & CONFERENCE**

owned by:  
**IDG WORLD EXPO**

managed by:  
**EVENT MANAGEMENT**

Send more information on Telecommuting & Home Office Exposition & Conference!

I am interested in: ☐ Attending ☐ Exhibiting

**NWW**

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_

email \_\_\_\_\_

Mail to: MHA Event Management, 1400 Providence Highway, P.O. Box 9127, Norwood, MA 02062. Or Fax to: 617-440-0357

**THIS IS NOT A REGISTRATION FORM.**

For more information, call **800-393-THOE**

See this on the WWW: <http://www.mha.com/thoe/>





# NU SWITCH DELIVERS NU SPEED

NuSwitch Fast Ethernet switches provide the kind of performance network managers dream of. Ten to twenty times the throughput of shared Ethernet. Our distributed switching architecture ensures wire-speed performance, and custom ASICs provide years of trouble-free operation. This, plus the widest selection of stackable switches, makes NuSwitch the best value in workgroup networking.

**NuSwitch. The Nu force in Fast Ethernet.**

Call **1-800-NPI-8855** for more information.



**NETWORK PERIPHERALS**

© 1997 Copyright Network Peripherals Inc. NuSwitch is a trademark of Network Peripherals Inc. All other trademarks shown are property of their respective owners.



# Management Strategies

Covering: Budgeting, Staffing and Career Planning

## Briefs

■ **Oracle Corp.'s ConText search engine and Web Application Server technologies** have added muscle to the Career-Path.com online employment Web site, transforming it from a job posting board into an online placement service.

Employers can now construct interactive home pages that contain company descriptions and list applicant skill-set requirements. Also in the works is a service that will let applicants build a resume online and indicate the preferred company/industry they want to join. When the site is fully populated, both services will work together to match applicants and employers.

© Oracle: (415) 506-7000

■ **Asset management company Micropath, Inc.'s computer inventory Project Plan/Request for Proposal template** can help companies jump-start asset management projects. Business and IT managers can use the tool to identify minimum requirements, methodology, project specifications, vendor qualifications and selection, proposal format and submission, and standard criteria needed for IT asset audit and inventory.

The free template, available on diskette or as an e-mail attachment, can be ordered from the company at [info@micropath-inc.com](mailto:info@micropath-inc.com) or by calling the number listed below.

© Micropath: (425) 702-1887

■ **ExecuTrain Corp. is now offering the Day-Timer Concepts, Inc. 4-Dimensional Time Management Seminar** at the following locations: Allentown, Pa.; Atlanta; Colorado Springs; Hartford, Conn.; Houston; Minneapolis; Nashville; Oklahoma City; Omaha, Neb.; Parsippany, N.J.; Phoenix; Richmond, Va.; and San Francisco. Additional training centers will offer the seminars in September.

The single-day seminar costs approximately \$195, although pricing may vary according to location.

© ExecuTrain: (800) 843-6984

## Cover your trademark bases before going online

*Do your homework to protect your company's rights and avoid trademark infringement on the Web.*

By Kurt D. Olender

Like so many entrepreneurs these days, Richard King, owner of a Columbia, Mo., nightclub called The Blue Note, created a Web site to publicize his business.

But King got far more than he bargained for when a New York-based club of the same name sued him in federal court for trademark infringement, trademark dilution and unfair competition.

The Blue Note case illustrates the hazard of establishing an online presence without first doing your homework. The Internet's wide accessibility is part of what makes it so attractive, but it also makes Web site establishment perilous if trademarks aren't first researched.

### What's in a name?

Trademarks are words or catchy phrases businesses use to identify their goods. Under federal law, the owner of a federally registered trademark is entitled to exclusive use of its mark in all 50 states in conjunction with specific goods and services.

For example, Exxon Corp. has the exclusive right to the trademark "Exxon" in connection with gasoline and petroleum products. The right to exclusive use of a trademark prevents others from using a word or phrase that is likely to cause confusion about the ownership of the trademark or the goods being sold.

However, there's one caveat: Successful registration of a trademark is only an indication that the trademark owner was the first person to file the registration application. The right to register and the right to use a mark are separate.

Many trademark owners never actually file registrations — they accrue trademark rights solely through the use of the

trademark. Without registration, the trademark owner is entitled to protection only in the states in which the mark is actually used.

Similarly, the owner of a registered trademark may not have the right to use the trademark in states where another person has trademark rights that predate that of the registered owner.

### PROTECT WHAT'S YOURS

Here are some steps to take when starting a new company or Web site:

- Perform a trademark search to determine whether your use of a specific name may infringe on someone else's trademark. This is especially important if you intend to conduct business in more than one state or over the Internet.
- Register trademarks as soon as you are legally entitled.
- Before creating a Web site, perform trademark searches for your domain name and company name for federal registrations and state registrations in all 50 states.
- Retain competent legal counsel and a trademark research firm to ensure that your company's rights are adequately protected.
- Regularly perform trademark searches to determine if anyone is infringing on your company's trademark.

In this situation, the registered owner of the trademark would have the right to exclusive use of the trademark in all states except those in which the preexisting trademark owner conducts his or her business. Simply put, trademark rights accrue primarily through use and not registration — an important distinction.

Before commercialization of the Internet, many forms of trademark infringement went unnoticed.

A small business that intentionally or accidentally used another company's trademark was unlikely to be discovered by the trademark owner unless they operated in the same market.

But by hosting a Web site, that small business is advertising itself

to the entire world and, more importantly, bringing its trademark use before the eyes of the trademark owner.

Conducting a trademark search prior to entering cyberspace can help protect your company from unwittingly becoming vulnerable to litigation. A trademark search will not only confirm the availability of a trademark for your company's use, but also can alert you to infringement of your company's trademarks by others.

"Businesses typically request trademark searches for several reasons — prior to selecting a business name to ensure that the selected name will not infringe on a trademark, prior to selecting a domain name or posting a Web site, and after a business has acquired rights in a trademark to verify that their mark is not being infringed upon," says Mark Miller, manager of corporate relations for Thomson & Thomson, a trademark research firm in North Quincy, Mass.

### Domain reality

It is important to recognize that the availability of a domain name does not establish that your use of that name will not infringe on a trademark. Remember that the Internet is accessible nationwide, as well as internationally.

Despite the fact that your company may conduct business only on the East Coast, it is entirely possible that a California company could assert that your domain name, or the use of your company name on the Internet, infringes on that company's trademark because your Web site is accessible to their customers in California.

This is a very real scenario. Courts have allowed a plaintiff in one state to bring a lawsuit against a company located in a distant state when the offending company's Internet advertising is intended to solicit customers in the plaintiff's state.

This does not mean that

every use of a trademark, even if substantially similar to another person's trademark, constitutes actionable trademark infringement.

The person asserting the infringement must still prove that your use of a trademark is causing, or is likely to cause, confusion with their mark.

### Ending on a happy note

The Blue Note case had a happy ending — the federal court in New York dismissed the case because it found that King only intended to attract customers in Missouri based on the fact that his site had a notice advising visitors that travel to Missouri was required to purchase tickets and attend shows.

This notice eliminated the likelihood that there could be confusion as to the ownership of the two clubs.

However, a little trademark research could have saved King a lot of trouble.

Don't be afraid to reap the benefits of an Internet presence, but remember the adage, "an ounce of prevention is worth a pound of cure."

*Olender is an attorney with Mandelbaum, Salsburg, Gold, Lazris, Discenza & Steinberg, a West Orange, N.J., firm specializing in intellectual property issues. He can be reached at [kolender@msn.com](mailto:kolender@msn.com) or (201) 736-4600.*

[www.nwfusion.com](http://www.nwfusion.com)

Go online for links to:

- The Department of Commerce Patent and Trademark Office, where you'll find a rundown of basic facts about registering a trademark
- Thomson & Thomson, a leading trademark and copyright research firm
- The Franklin Pierce Law Center Intellectual Property Mall — offering one-stop shopping for intellectual property information













## Senior Network Technicians

Trumbull, CT

Oxford is seeking highly-skilled, energetic team players to install, configure and maintain all components for their corporate network.

The selected individual will interface with our Network Engineering staff to define standards, monitor production, target and troubleshoot problems and implement remedies for performance issues.

Qualified candidates must possess strong troubleshooting, problem-solving and communication skills. Extensive knowledge of TCP/IP, IPX, AppleTalk, Ethernet, FDDI, ATM, Frame Relay and ISDN is required. Candidates must have extensive experience configuring CISCO Routers and various types of Ethernet switches/hubs. High school graduate or equivalent with at least 3 years of experience as a Network Technician in LAN/WAN environment is required. Must have the ability to work extended hours and weekends as necessary.

For consideration, please forward your resume to: Human Resources, Dept. LS/SNT, 48 Monroe Turnpike, Trumbull, CT 06611. Fax: 203-459-7989.



## Experienced Telecommunications Professionals

*Bellcore is experiencing explosive growth and success in the telecommunications industry and is seeking highly motivated, innovative individuals who would like to help shape the telecommunications infrastructure of the emerging information age.*

**brilliantly accomplished**

## We're everything you'll imagine us to be.

Due to our tremendous growth and success we are currently seeking the following candidates:

### Telecommunications Engineers

Individuals must have a background in telecommunications engineering spanning 2-5+ years. Qualified applicants will have a Bachelors or Masters degree in Electrical Engineering, Systems Engineering or a related field.

The following opportunities are available:

- Telephony Operations
- Traffic & Performance Engineering
- Switching
- Transport & Operations Systems
- Software Quality Engineering
- Testing & Analysis
- Signaling
- Risk & Reliability Analysis
- Network Administration & Maintenance
- Program & Major Project Management
- Security & Fraud Reduction
- Disaster & Business Contingency Planning

A background in one or more of the following is required: Internet (particularly R & D and network planning) and Internet Protocols; Data Communications; Frame & Cell Relay; SONET; ATM; Telecommunications Management Network (TMN) & OS Planning; Operations Network Architecture; AIN Planning; Intelligent Networking; Wireless Technologies; Telecommunications Switching and Signaling; Synchronous Digital Hierarchy (SDH); Fiber in the Loop; Asymmetric Digital Subscriber Line (ADSL); MMDS, LMDS, DBS & IDLS; High Speed Optical Transport; Wavelength Division Multiplexing (WDM); AOM; Information Modeling; Network Planning and ISDN.

### Software Professionals

Individuals must have a background in software development spanning 2-5+ years. Qualified applicants will have a Bachelors or Masters degree in Computer Science or Electrical Engineering. Candidates with a Math, Psychology or English major with computer programming backgrounds are also welcome to apply.

The following opportunities are available:

- Software Developers
- Testers
- Usability Engineers
- Project Managers
- Systems Engineers
- Systems Administrators
- Internet Developers
- Technical Writers

A background in one or more of the following is required: C, C++, Unix, Dbase, Informix, Visual C++, GIS Tools/Graphics; GUI; Visual Basic; Oracle; PowerBuilder; Windows NT Platform; HP-UX Platform; Stratus VOS; IMS; MVS Open Platform; PL/I; Human Factors; Client-Server Technology; JAVA or HTML.

We offer a competitive salary and compensation package as well as incomparable resources which are in keeping with our leadership position. For immediate, confidential consideration, forward your resume indicating position of interest and salary requirements, which must include Dept. Code 003, to: e-mail: [employ@hr.bellcore.com](mailto:employ@hr.bellcore.com) (please indicate dept. code in document text); **Bellcore, Recruiting & Staffing, 6 Corporate Place, Piscataway, NJ 08854.** As all resumes are electronically scanned, please submit on plain white bond paper, using standard format and fonts. We regret that only applicants who are being considered will be contacted. No phone calls, please. We are an equal opportunity employer.

**Bellcore**  
[www.bellcore.com](http://www.bellcore.com)

Computer

## CHECK THIS OUT AND WATCH WHAT DEVELOPS

Paul-Tittle Associates currently has incredible opportunities for professionals to join one of the country's "Top 100 Best Places to Work." Located in Northern Virginia, our client offers stimulating work, excellent pay, flexible working hours and great benefits. If you've got skills in any of the following, and are interested in real cradle-to-grave systems development, then this is your opportunity to develop a fast-track career.

- C/C++
- DSP
- GUI
- Motif
- OOA/OOD
- Oracle
- pSOS+
- Real-time
- Embedded systems
- SunOS/Solaris
- Sybase
- TCP/IP
- Unix
- Windows
- Windows NT
- X-Windows

Applicants must be US citizens. Bachelor's degree is required. Selected individuals may be subject to a government security investigation. An equal opportunity employer.

To apply, e-mail, fax or mail your resume to:

**Best 100**  
**Paul-Tittle Associates, Inc.**  
1485 Chain Bridge Road,  
Suite 304  
McLean, VA 22101  
E-mail: [best100@Paul-Tittle.com](mailto:best100@Paul-Tittle.com)  
FAX: (703) 893-3871



Paul-Tittle Associates, Inc.



**JAVA**

Application Development

6/30 Issue  
Closes 6/18

## DON'T MISS THESE GREAT ADVERTISING OPPORTUNITIES IN JUNE / JULY

ISSUE	SPECIAL FEATURE	SPACE CLOSE
6/30	Server Review Series; Special Focus: Java Application Development; Technology Update. Gigabit Switching routers	June 18th
JULY	IntraNet Magazine	June 20th
7/7	Review: Security Products	June 25th
7/14	Buyer's Guide: High-end Routers	July 2nd
7/21	Special Section: Telecom in Transition	July 9th

FOR MORE INFORMATION OR TO PLACE AN ADVERTISEMENT, PLEASE CALL PAM VALENTINAS AT 1-800-622-1108.

Programmer Analyst: Customize client-server based Enterprise Resource Planning (ERP) package; develop & implement software at customer sites; develop part serial tracking (Part tracking) system for major industrial plants using SYBASE & APT-WORKBENCH. Position requires master's degree in Computer Science or similar major or any engineering field. Must have working knowledge of SYBASE and APT-WORKBENCH. 40 hrs/wk; 8am-5pm; salary of \$58,000/yr. Send resume with Social Security No. to Indiana Dept. of Workforce Development, 10 N. Senate Ave., Indianapolis, IN 46204-2277, Attn: Gene R. Replogle. Include ID#3450509 with response. Applicants must be eligible for permanent employment in the United States.

## ATM

We are seeking Professionals with ATM and SS7 experience to join our AIN Team. Contract and permanent positions available nationwide.



Attn: Steven Darrah  
Phone: 1.800.676.7374 ext. 228  
FAX: +1630.717.0909  
[sdarrah@trans-tech.com](mailto:sdarrah@trans-tech.com)  
[www.trans-tech.com](http://www.trans-tech.com)



## Help create the fastest-growing online service in the world.

Juno Online Services is the nation's second-largest e-mail provider, supplying nearly 2.5 million members with free e-mail since our launch in late April of last year. Already the largest free e-mail provider in history, Juno aims to provide millions more with their first connection to the Internet. We are looking to hire exceptionally talented computer scientists, systems and network engineers, database architects and administrators, WWW programmers, and other software professionals to join our world-class technical staff.

We'd like to hear from individuals with outstanding skills in areas including:

- Object-oriented design and analysis
- Distributed systems: TCP, UDP, ISIS
- Windows programming: MFC, SDK
- Systems administration: Solaris, SunOS, NT, Sybase
- Router/Firewall configuration: BGP, RIP, OSPF
- Programming languages: C++, SQL
- Scripting languages: Tcl, Perl, Sh, Awk
- Internet Mail standards: RCF821, RFC822, RFC1425-28, RFC1123, RFC1341
- Quality Assurance: MS Test and QA Partner
- Regression and functionality testing
- Formulating and writing testing plans, modules, and scripts

Dynamic, informal environment (no suits, no ties); abundant technical and intellectual challenges; dramatic upside potential for stellar performers.

Send your resume as a plain text or Microsoft Word attachment to: [techjobs@recruit.juno.com](mailto:techjobs@recruit.juno.com)



Free Internet E-mail

## OUR SCHOOL KIDS NEED YOU. WE NEED YOU TOO.



More than 13,000 schools serving 9 million students realize the benefits of our proven software products. We're Jostens Learning Corporation. No other educational software company offers the range of K-12 products and services Jostens Learning does. And no other software company offers the range of challenges to talented professionals with the skills and desire to make a difference. Our specialized needs include the following for various locations THROUGHOUT THE U.S.:

### SR. SYSTEMS ENGINEER

Provides support in the installation, modification, troubleshooting, and diagnosis of JLC s/w. Responsibilities include working as

part of a customer-oriented team to ensure good customer relations and satisfaction. AA in tech. field (BS pref'd) and 3 years' related exp. or equiv. required. CNE/ECNE and 5-8 years' technical and supervisory exp. pref'd, as well as exp. with LANs (Novell and AppleShare). Excellent analytical, interpersonal, communication, and customer service skills essential. Overnight travel required.

### SYSTEMS ENGINEER

Provides h/w and s/w service including new installation, updates and troubleshooting of network operating systems. Min. 2 year technical degree, at least 2 years exp. as a Systems Engineer in a field environment, and CNE pref'd, as well as exp. with LANs (Novell and AppleShare). Excellent communication and customer service skills required. You must have a serviceable vehicle and an excellent driving record.

To learn more about our industry leading software development company, visit our Website at: <http://www.jlc.com>

We offer excellent benefits, including immediate participation in 401(k) plan with guaranteed match. Please submit resume and cover letter to: Jostens Learning Corp., Job Code: BP, 9920 Pacific Heights Blvd., San Diego, CA 92121. INTERVIEWS WILL BE CONDUCTED LOCALLY. No Phone Calls Please. JLC is dedicated to workforce diversity and EOE.



**Jostens Learning™**  
Together, Making A Difference

## PC/LAN SUPPORT SPECIALIST LOEWS CORPORATION

Provide technical support for LAN/IBM PC environment including Microsoft Office and WordPerfect. Duties will include Windows NT 4.0 administration/troubleshooting and working with end users to resolve technical issues.

We require in-depth, hands-on experience installing, configuring, and troubleshooting LAN operating systems, preferably in a Windows NT 4.0 environment. Experience with support in productivity suites and installing PC hardware and software required.

We provide an excellent compensation package with opportunity for professional development. Mail/fax your resume with salary requirements to: Loews Corporation, Employment Manager, 655 Madison Avenue, 7th Floor, New York, NY 10021. Fax: 212-521-2525. EOE.

**Programmer Analyst:** Design and develop user interface screens & enhancements for accounts payable, accounts receivable, purchasing, & order entry financial modules; responsible for maintenance and performance tuning of modules; utilize Oracle Forms 4.5 as the front end & Oracle 7.3 as the back end database on HP-9000 (UNIX); program in C and Pro\*C languages. Position requires master's degree in Computer Science or similar major or any engineering field. Must have working knowledge of Oracle 7.2 or higher database, HP9000 (UNIX) operating system, and Pro\*C language. 40 hrs/wk; 8am-5pm; salary of \$65,000/yr. Send resume with Social Security No. to Indiana Dept. of Workforce Development, 10 N. Senate Ave., Indianapolis, IN 46204-2277. Attn: Gene R. Replogle. Include ID#3450510 with response. Applicants must be eligible for permanent employment in the United States.

**Software Engineer III.** Duties: Develop system software for NetWare products, SMP, Cluster Services, Windows 95/Windows NT client platforms. Write system software as portable modules such as NetWare Kernel & PSM to run across NetWare servers and multiple clients using C, Assembly, logic analyzer and knowledge of PC architecture, SMP, NetWare/Windows NT kernel debugging, MPS 1.4 specs, PCI specs and APIC. Requirements: B.S. or equivalent in Computer related field. 2 years kernel level development experience. Must know C, Assembly, logic analyzer, knowledge of PC architecture, SMP, NetWare/Windows NT kernel debugging, MPS 1.4 specs, PCI specs and APIC. Salary: \$66,000/yr. Send resumes to: DEPT. OF WORKFORCE SERVICES, EMPLOYMENT DEVELOPMENT DIV., 5th Floor. Attn: Pat Redington, Job Order # 3060362, 140 East 300 South, SLC, UT 84111.

**Technical Editor II (Portuguese).** Duties: Review translations by third parties for linguistic quality and technical accuracy. Provide linguistic support to 3rd party translation vendors in Brazil. Develop and maintain terminology databases for users, clients and vendors in Brazil. Coordinate terminology research and develop acceptance criteria for translations. Write and maintain style guides, project notes, post-mortem reports, linguistic and QA reports to vendors. Provide Linguistic project management for translation portion of localization process. Provide translations as needed. Requirements: B.S. or equivalent in Translation or related field. 2 years technical translation experience in Portuguese/English. Must have near native fluency in Brazilian Portuguese and have good technical writing skills in English and Portuguese. Salary: \$45,281.50/yr. Send resumes to Utah Dept. of Workforce Services, E.D.D.-5th Floor, ATTN: Pat Redington, Job Order #3060364, 140 East 300 South, SLC, UT 84111.

**Sr. Software Engineer.** Duties: Act as Technical Lead in Client32 group. Responsible for Native IP implementation on Client32. Develop PRINT module, Volume handling module and Netframe auto-reconnect requirement study. Develop system software for NetWare Clients, Windows 95, Clustered Servers on Windows 95 platforms. Consult with other developers, develop portable modules. Work on IETF standard for DHCP and SLP. Name Resolution on NDS trees for NetWare server. Using C and Assembly programming, Internet protocols, NLM programming, VxD programming on Windows 95 and NetWare platforms and NetWare(kernel) Operating System debugging. Requirements: M.S. or equivalent in Computer Science related field. 2 years operating system level development experience. Must know C & Assembly programming, Internet protocols, NLM programming on Windows 95 & NetWare platforms and NetWare operating system level debugging. Salary: \$67,230.00/yr. Send Resume to: DEPT. OF WORKFORCE SERVICES, EMPLOYMENT DEVELOPMENT DIV., 5th Floor. Attn: Pat Redington, Job Order #3060361, 140 East 300 South, SLC, UT 84111.

## July ~~Internet~~ Net

Closes June 20th

**Bonus Distribution** at Network World's Managing Enterprise Networks; Internet Expo Boston

**For More Information  
on Advertising  
in Networking Careers  
Contact Pam Valentinas  
1-800-622-1108**



## Attention Notebook Users M8169 Fast Ethernet CardBus Adapter



The fastest CardBus adapter on the market today...

- ❖ FCC Class B
- ❖ Complete Driver Suite
- ❖ Lifetime Warranty



ordering information:

1-800-635-1274

<http://www.racore.com>

**RACORE**

Reader Service No. 281

# Marketplace

The Hub of the Network Buy

## Free Product Information

To receive more information circle the reader service numbers of products that interest you.

Send this coupon to: Network World P.O. Box 5090, Pittsfield, MA 01203 or Fax (413) 637-4343, or use the prepaid card elsewhere in the issue.

Expires 9/29/97

Name:	217	218	219	220	221	222	223
	224	225	226	227	228	229	230
Title:	231	232	233	234	235	236	237
	238	239	240	241	242	243	244
Company:	245	246	247	248	249	250	251
	252	253	254	255	256	257	258
Phone: (   )	259	260	261	262	263	264	265
	266	267	268	269	270	271	272
Street:	273	274	275	276	277	278	279
	280	281	282	283	284	285	286
City:	287	288	289	290	291	292	293
	294	295	296	297	298	299	300
State:	301	302	303	304	305	306	307
Zip:	308	309	310	311	312	313	314

6/16/97

# Breakthrough

In Keyboard  
Monitor  
Switches

Multi  
Platform &  
On-Screen  
Display



SEE US AT PC EXPO  
June 17-19,  
New York, NY  
Booth #2221

**BREAKTHROUGH** the clutter of multiple keyboards, monitors, and mice with this latest **INNOVATION** from Rose. This switch has every feature you asked for:

Switches several servers or computers to a single monitor, keyboard, and mouse

Supports any mix of PC, Apple, Sun, RS 6000, HP 700 series, DEC Alpha, SGI, or other computers from any keyboard or mouse

Front panel has keypad for easy selection of computers and configuration

Front panel display shows computers name and other information

Command to switch can come from your keyboard, front panel, or RS232 port

Simple to use keystrokes switch computers for fast and easy control

Built in daisy-chaining supports up to 256 computers

Flash memory for future upgrade of features

Easy to use **OverView™** system gives control and status with on-screen graphics

Many other features!

**CALL FOR A FREE CATALOG:**

- ◆ Keyboard/Video Control
- ◆ Print Servers
- ◆ Data Switches

**800-333-9343**

VISIT OUR WEB SITE AT [WWW.ROSEL.COM](http://WWW.ROSEL.COM)



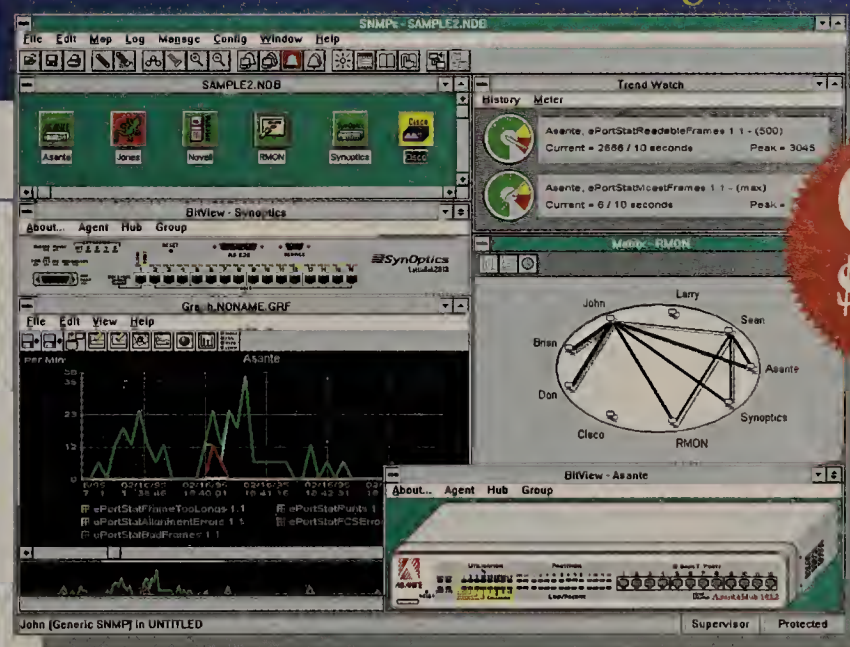
**ROSE  
ELECTRONICS**

10707 STANCLIFF ROAD HOUSTON, TEXAS 77099 TEL 281-933-7673 FAX 281-933-0044

Reader Service No. 289

# SNMPC

Network Manager for Windows



Only  
\$795



- Full RMON Support
- Integrates with HP OpenView
- TCP/IP, Telnet, TFTP, BOOTP
- WinSNMP/WinSock/DDE APIs
- SNMP, ICMP, IPX Polling

- Node Discovery
- Long Term Statistics/Thresholds
- Custom Event Actions/Forwarding
- Over 100 Device Specific GUIs
- MIB Compiler/Browser



**Castle Rock  
Computing**

**408-366-6540**  
Fax: 408-252-2379

Reader Service No. 252



# CONTROL

## Your NT Servers



from Anyplace in the World!



If you are responsible for your company's NT Servers, your world really is at your fingertips. Control **any** Windows NT Server at a moment's notice, and decrease the time and money you're spending to administer your network. Start controlling your world immediately with your **FREE (10)** user evaluation copy at [www.AVALAN.com](http://www.AVALAN.com).

**Remotely Possible/32 ...the fastest remote control software!**

**AVALAN**  
TECHNOLOGY

(508) 429-6482 • FAX (508) 429-3179 • (800) 441-2281  
P.O. Box 6888, Holliston, MA 01746 • Email [AVALAN@AVALAN.com](mailto:AVALAN@AVALAN.com)  
Remotely Possible is a registered trademark of Avalan Technology, Inc.

Reader Service No. 276

# GET FLEX with ASCEND

**MAX 4048 with K56Flex Technology**  
**Available Now - Call for Special ISP Pricing**

The **MAX 4048** is specifically designed for two T1/PRI operations and features Ascend's new Series56 digital modems. This high-performance, RISC-based product delivers more features and better price-per-part than anything else in its class.

Call for info on FREE upgrades for MAX products purchased after November 1, 1996!

**AVAILABLE NOW!**

The **MAX TNT** is the only WAN access switch that concentrates both dial-up and dedicated traffic in a single platform, providing unprecedented capacity at a breakthrough price.

The **GRF 400 IP Switch** is specially designed to handle network growth while providing consistent high performance, regardless of the dynamics of the network. The GRF 400 was awarded **1997's Product of the Year** by Network Magazine.

**AVAILABLE NOW!**



**Remote Networking**  
**Solutions That Work.™**

### ADDITIONAL ASCEND PRODUCTS:

P50-1UBRI	Pipeline 50	ISDN, built-in NT1	\$595.00
P75-1UBRI	Pipeline 75	U Interface	\$655.00
P130-UBRI-FT1	Pipeline 130	w/T1/FT1 & BRI	\$1,396.00
MX-18BRIU	MAX 1800	Eight BRI U Interface	\$4,900.00
MX20-1T	MAX 2000	One PRI/ISDN soft	\$6,187.50
MXHP-4T1-4	MAX 4004 base chassis with Four T1		*
MXHP-2T1-2	MAX 4002 base chassis with Two T1		*

\*call for special ISP pricing



**SOLUNET**  
Nothing But NETWORKS

1-888-SOLUNET  
FAX 407-676-0809  
[SALES@SOLUNET.COM](mailto:SALES@SOLUNET.COM)  
[WWW.SOLUNET.COM](http://WWW.SOLUNET.COM)

Reader Service No. 298

## Field Service Problems? One small WAN/LAN Analyzer solves them!



- **Less than 5 pounds**
- **Simultaneously monitor both sides of the network**
- **Test over 160 protocols: Frame Relay, SMDS, ISDN...**
- **All popular interfaces**
- **PPP/Async**
- **Easy to use Windows GUI**
- **DataKit support**
- **ISDN - Dual Channel**



**RADCOM**

Phone: 1-800-RADCOM-4 201-529-2020 Fax: 201-529-0808  
E-Mail: [74777.3702@compuserve.com](mailto:74777.3702@compuserve.com) Web Site: <http://www.radcom.co.il>

Reader Service No. 295

# WANTED!

**RESELLERS & ISPs**

**Call NOW! (888)575-ISDN**

### ARESCOM APEX™ ISDN ROUTER

- Automatic ISDN SPID, switch type & line speed detection
- Bandwidth/Dial-on-demand
- Dialup remote configuration
- Analog phone/fax ports
- Secure networking
- IP routing
- 128 Kbps
- Windows® 95 GUI support

**NEW FEATURES**

- Dynamic IP
- Dial-up Remote Management



APEX 1100

Call for details on internal & external ISDN terminal adapters.

ARESCOM designs, manufactures, and markets a wide range of quality Internet equipment to meet your needs. We also have attractive reseller and ISP programs, for more information please contact us at (888)575-ISDN.

**ARESCOM**

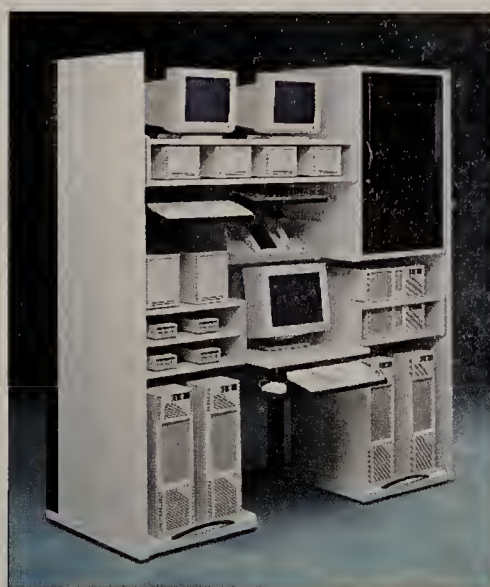
Email: [sales@arescom.com](mailto:sales@arescom.com)  
URL: [www.arescom.com](http://www.arescom.com)

© 1997 ARESCOM, Inc. ARESCOM, Flash, and Apex are trademarks of ARESCOM, Inc. Windows95 is a registered trademark of Microsoft Corp.

Reader Service No. 284



# Over



# 50,000



# Served.

**H**ow does Wright Line satisfy over 50,000 network managers?  
We give them a full serving of network solutions...

From open configurations—to closed security sensitive environments—to combinations of both—to our complete line of 19" and 24" standard and NEMA enclosures, the LAN Management System (LMS) of technical furniture and enclosures lets you have it your way. No matter your application, hardware requirements, or size.

LMS consistently serves up the highest quality, most complete product menu in the industry. Add to that our special ingredients: a lifetime warranty, direct sales engineers, plus a QuickShip delivery program for custom orders, and you'll discover why we're the leader in total value network solutions.

Check us out. We'd love to serve you.

## Check Us Out!

Contact Wright Line for a **FREE** Color Brochure.

I have a need in: ☐ 30 ☐ 60 ☐ 90 days.

Fax: 508 853-8904 Tel: 800 225-7348  
www.wrightline.com

Name/Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

City \_\_\_\_\_

Phone ( ) \_\_\_\_\_

1NETW97

U.S. Patent Des. 363,701

**VISIT US AT PC EXPO,  
BOOTH #2181**

Reader Service No. 287

**W R I G H T • L I N E**  
technical environment solutions



# NEED A SAFE NETWORK?



Concerned about seeing  
and repelling Internet and  
Intranet sharks?

**Try SessionWall-3™**  
Free Download  
[www.abirnet.com](http://www.abirnet.com)

- ✓ Puts you, not the sharks, in control
- ✓ See what's really going on
- ✓ Content level controls
- ✓ Protects your entire network
- ✓ Detects, blocks, scans, views, reports
- ✓ Easy to install and use
- ✓ Self configuring/monitoring
- ✓ Runs on Windows 95 or NT
- ✓ No network overhead
- ✓ Affordable



web: [www.abirnet.com](http://www.abirnet.com) email: [abirnet@abirnet.com](mailto:abirnet@abirnet.com)

1-800-245-1688 1-817-251-7000 fax: 1-817-251-7001

Reader Service No. 305

# Let's Talk TurnKey!

**Total Online Systems Solutions**

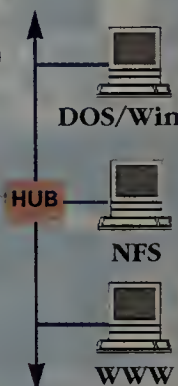


- Plug & Play Mass Storage Networking
- Compatible with ALL Major Operating Systems
- Latest and Fastest CD-ROM Drives
- Customizable Drive Arrays
- Remote Access Systems
- Internet/Intranet Servers
- CD Writers/Duplicators/Media
- Direct Partners with Major Manufacturers
- Available under GSA Contract
- Toll-Free Technical Support

## OPTI-NET® Direct HL-7

- Completely installed and ready for use
- Fully equipped 7-Drive CD-ROM Tower
- Compatible with NetWare, Windows (NT and 95), UNIX, and OS/2
- Works on existing Ethernet network
- No NLMs and no TSRs
- Protocol independent

**SPECIAL**  
**Only \$995!**  
(Standalone Tower \$695)



**TODD ENTERPRISES INC**

800-445-TODD (8633) • 516-777-8633  
FAX: 516-777-2750 • <http://www.toddent.com>

Reader Service No. 266

<http://www.amcoengineering.com>

## LAN/DATA Cabinets

**FLEXible** Choice of styles,  
heights, widths, depths

**HuGe SeLection of PreasSEMBled**  
**CONsoles & AccEsSORIES**

**SHIPPING Programs**  
To fit Your Needs



Surfing the net  
management  
cost-efficient reach  
mail EMAIL  
access  
data  
global W  
d WIDE  
revolution

AreA Netw

INTERNAtional

AMCO

wireless comm

management cost

EMAIL

high

Telecommunications

LAN

WAN

Ne

Accessories

Choice

of 20 spectacular colors

FULLY ASSEMBLED

For sales & assistance

1-800-833-3156

fax at 847-671-9469

**Accessories**  
for Packaging Support

**Choice**  
of 20 spectacular colors

**FULLY ASSEMBLED**

Local Sales Representatives  
to Assist in your Design  
Application

Reader Service No. 264

## WEB-ENABLED HOST ACCESS

CR NetSuite is the total TCP/IP solution for IBM  
mainframes. Access mainframe applications via:

- Web Browsers
- TN3270
- Telnet
- Java emulators
- SDLC terminals and printers

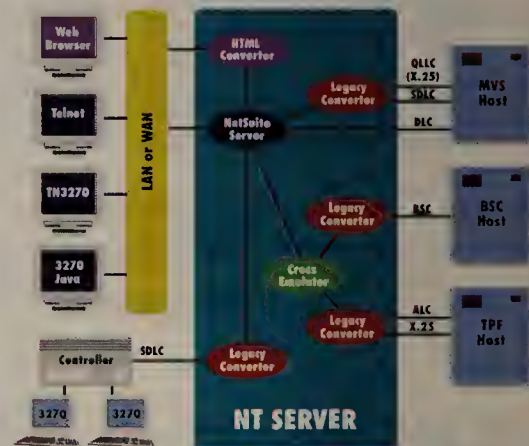
To learn more about CR NetSuite contact us at:

Internet: [www.crsystems.com](http://www.crsystems.com)

Phone: 1.800.732.3664 or 404.767.8230

Fax: 404.767.1372

e-mail: [crus@crsystems.com](mailto:crus@crsystems.com)



**CR-SYSTEMS**

Reader Service No. 267

3COM, CISCO, CITRIX, CUBIX, DIGITAL PATHWAYS, EICON, MICROSOFT, PEOPLESOFT,

SAP, SDI, SHIVA, US ROBOTICS, WYSE,

**ATI** Async Technologies, Inc.

**REMOTE ACCESS = CONFUSING?** For over six years,  
ATI has specialized in integrating, installing and supporting  
**ONLY** remote access servers.

For **FREE CONSULTING** call;

Detroit, MI: (810) 738-8308

Charlotte, NC: (704) 676-0020

Indianapolis, IN: (317) 845-9147

Chicago, IL: (847) 605-8320

Cleveland, OH: (216) 520-0031

Ft. Lauderdale, FL: (954) 938-9844

Cincinnati, OH: (513) 891-0033

3COM, CISCO, CITRIX, CUBIX, DIGITAL PATHWAYS, EICON, MICROSOFT, PEOPLESOFT,

Reader Service No. 242



## Keyboard/Video & Mouse Switches

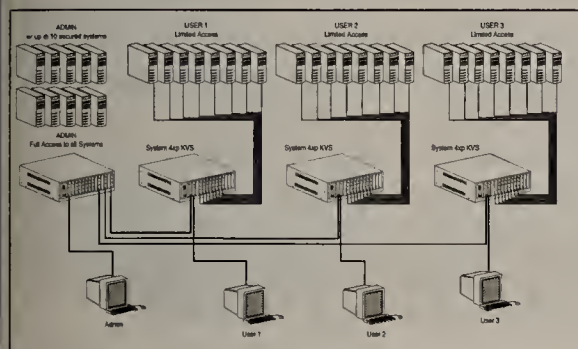
KVM Switches do much more than just switch user peripherals. But, with all the products on the market today, which system will be the best solution for your company?

### THE SMART CHOICE IS TRON.

Let experienced technicians take you through the Keyboard/Video Switch maze of vendors and products. We introduced the technology to you in our Industry Standard Keyboard/Video Switch (KVS) White Paper. Tron uses and test KVMs products in our own offices and labs, so we can provide better service to our buyers.

Where each vendor promotes their own product, Tron will give you a complete comparison of several products all at once. Give your-

self complete control over your data center and how it's personnel operate with the products that are right for your application. We'll assist in your selections and explain system enhancements using Extender/Expander products.



This KVM System design was configured by our technicians using the 4xp system from Cybex. Multi-User products are also available from Rose and Apex PC, and our experience with KVMs makes Tron the only supplier that can design a completely pre-tested multi-vendor KVM system.

(800) 808-4672

Ask for a **FREE** KVMs White Paper  
Or, download it from our internet site @www.tron.com

**TRON**  
INTERNATIONAL, INC.

Reader Service No. 233

## Don't stay LAN-locked...



### Break out with Internet e-mail.

Forget inter-office boundaries. Whether you use Lotus cc:Mail, Novell GroupWise, Lotus Notes, Microsoft Mail or Exchange... in just minutes, your entire organization can be "connected" with TOLL-FREE, reliable, virus scanned Internet mail capabilities. We'll help set up and configure your system—even register an Internet domain name. Don't be a victim of LAN-lock... Internet mail can be yours easily and affordably. Call us today to set up a free trial account.

**AllegroNET™**  
the corporate e-mail authority

**1-800-209-MAIL**

info@allegro.net  
http://www.allegro.net

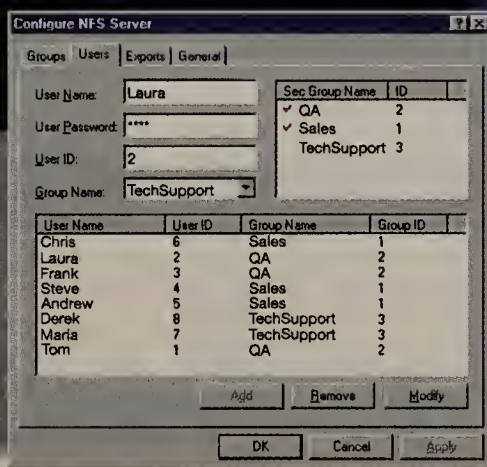
Lotus cc:Mail, Novell GroupWise, Lotus Notes, and Microsoft Mail & Exchange are trademarks of their respective companies.



Reader Service No. 303

## Distinct IntraNet Servers™

The Easiest Way to Manage Users and Network Resources



### Highlights:

- Includes all major TCP/IP based file and printer servers in a single package: NFS Server, FTP Server, LPD, TFTP and BOOTP.
- Integrates seamlessly into Windows 95 and Windows NT
- Password protected login for all servers
- Also available for Windows 3.1.

**Free  
Evaluation Copy  
Available at...**



**distinct**  
The world leader in Internet development tools.

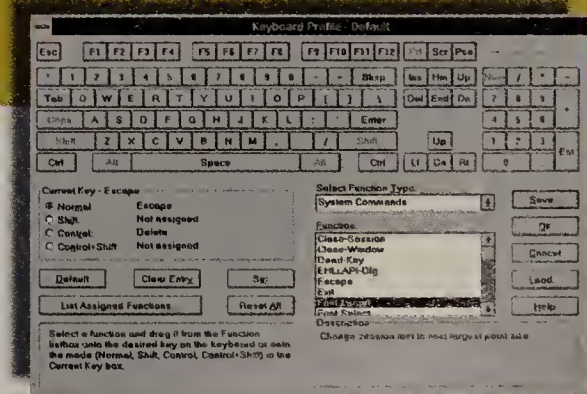
**408.366.8933**

http://www.distinct.com  
Fax: 408.366.0153  
E-mail: networkw@distinct.com  
Fastfacts: 408.366.2101

Reader Service No. 268

## Distinct IntelliTerm

Integrated Terminal Emulator for DEC and IBM® Systems



### Highlights:

- TN3270 Emulation-Models 2,3,4 and 5 (for IBM Mainframes)
- 3179G Vector Graphics & 3279S3G
- TN5250 (24x80, 27x132) (for AS/400)
- VT52, VT100, VT220, VT320 & VT420 emulation (for DEC and UNIX Systems)
- Customizable keyboard layouts, popups and session profiles
- VBA™ Advanced Scripting Language
- DDE, HLLAPI, EHLLAPI, WinHLLAPI and Visual Basic™
- Available for Windows 3.11, Windows 95 and Windows NT

**Free  
Evaluation Copy  
Available at...**



**distinct**  
The world leader in Internet development tools.

**408.366.8933**

WWW: http://www.distinct.com  
Fax: 408.366.0153  
E-mail: networkw@distinct.com  
Fastfacts: 408.366.2101

Reader Service No. 273



A SOFTWARE ONLY 32-BIT NETWORK ANALYSIS APPLICATION  
SO FULL OF FEATURES, YOU WON'T BELIEVE THE PRICE.

\$695.

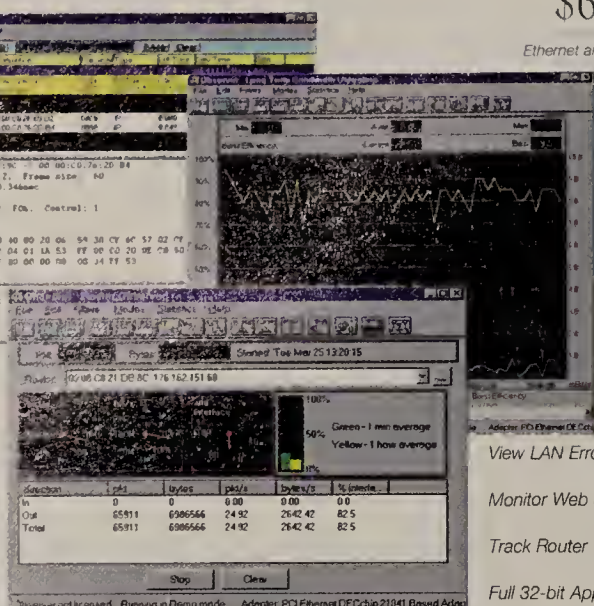
Ethernet and Token Ring

Capture and Decode Protocols

Monitor Bandwidth Utilization

Grade LAN Efficiency

Track Long-term LAN Statistics



View LAN Errors (vital signs)

Monitor Web Servers

Track Router Traffic in Real Time

Full 32-bit Application (95/NT only)

## OBSERVER™ 4.0

If you have network slowdowns, would you know if they were due to overloaded bandwidth, broadcast storms, or errors? Observer can show your LAN traffic in real time, and with this information, pinpoint problems. Once the source and cause is found, solutions and action plans

become clear. Start seeing what you have been missing! Call 800-526-7919 for a FREE DEMO or Download from our web site.

[www.networkinstruments.com](http://www.networkinstruments.com)



©1997 NETWORK INSTRUMENTS, LLC CORPORATE HEADQUARTERS (612) 932-9899 FAX (612) 932-9545, UK AND EUROPE  
+44 (0) 1474 702427 FAX +44 (0) 1474 707830 INTERNET [info@networkinstruments.com](mailto:info@networkinstruments.com)  
[www.networkinstruments.com](http://www.networkinstruments.com) OBSERVER™ IS A TRADEMARK OF NETWORK INSTRUMENTS, LLC MINNEAPOLIS, MN USA

Reader Service No. 290

# Unlock Remote Systems



Turn power on/off, reboot, or reset remote systems from anywhere via laptop, phone or workstation.

Dataprobe's A/C power control products cover everything from single outlet to entire network control — whatever you need to restore your critical network.

Call and talk to an applications engineer.

For a preview, visit our web site at  
<http://www.dataprobe.com>



11 Park Place • Paramus, NJ 07652 USA • (201) 967-9300  
Fax (201) 967-9090 • E-mail: [sales@dataprobe.com](mailto:sales@dataprobe.com)

Reader Service No. 285

# SYSTEM LOCKED? WE'VE GOT THE KEY!

Unlock "LOCKED-UP" CPU's Remotely with TeleBoot.®

Now you can Reboot Systems Remotely using a Telephone or Modem, **even if the Host Modem answers!**

TeleBoot® works on PC's, LAN's, Servers, MINI's, etc. and offers a Security Access Code.

The units are available in three and five outlet versions. Starting from \$249.00.

TeleBoot® is your **KEY** to minimizing System Downtime.

**TeleBoot®**  
Starting From As Low As **\$249.**



**U.S.A.**  
Communications Corp.  
493 9 Johnson Ave., Yonkers, N.Y. 11716  
Phone (516) 244 6851 Fax (516) 244 5725

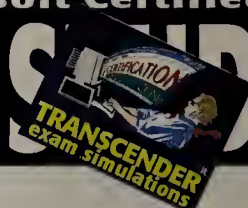
**yes**  
It runs with NetWare

CALL TODAY  
TOLL FREE  
**1-800-724-5434**

Reader Service No. 258

What does it take to get Microsoft® Certified?

# STUDY STUDY STUDY



Get the certification that matters.

If your company is among the many using Windows NT®, then Microsoft certification is the best way to assure technical proficiency. Transcender gives you timed, predictive simulations of Microsoft certification exams.

If you use Transcender, you'll pass the Microsoft certification exam or we'll give you your money back.\*

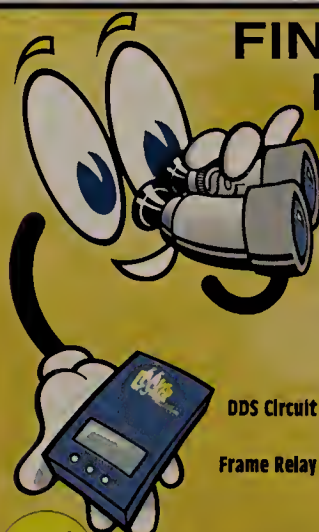
We offer 13 exams for the Certified Systems Engineer track, as well as 7 for the Certified Solution Developer track. Visit our Web site for FREE demos and complete product info.

Call 615.726.8779 FAX 615.320.6594 \* Conditions apply. See our Web site for details.

Transcender®  
242 Louise Ave.  
Nashville, TN 37203

**WWW.transcender.com**  
Reader Service No. 222

**Microsoft**  
SOLUTION PROVIDER



## FINALLY! Frame Relay Made Easy!

- Reduce installation time and cost.
- Eliminate troubleshooting guesswork.
- Decrease network downtime.
- Non-frame relay DDS lines too!

DDS Circuit	Ready/Not Ready	Data Rate	Line Quality	Network Test Detect
Frame Relay	Ready/Not Ready	Link Management	Network DLCLs	Network Test Detect

\$495



On-line orders: [www.proteltd.com](http://www.proteltd.com)

4480 Shopping Lane, Simi Valley, CA 93063 (888) HT LOOKER

Reader Service No. 229











# USED CISCO DIRECT

**NETFAST**

Save up to 80% on new/used:

➤ Routers ➤ Switches ➤ T1 CSU/DSUs ➤ Hubs  
➤ ISDN/ATM ➤ Frame Relay ➤ Modems

**CISCO SYSTEMS**  
**WE BUY USED**

➤ CISCO ➤ Bay Networks ➤ 3COM ➤ Ascend ➤ Livingston ➤ IBM  
➤ ADC Kendrox ➤ Adtron ➤ USRobotics ➤ Shiva ➤ HP  
➤ Newbridge ➤ Cobletron ➤ Sun  
➤ Motorola ➤ Madge ➤ Intel

www.digitalwarehouse.com

**DIGITAL WAREHOUSE**

Your Information Superhighway Discount Source

**800-439-8558**

MasterCard

210-20 23rd Ave. Suite #2, Bayside, NY 11360 Phone: 718-428-3139 Fax: 718-281-1186

Circle Reader Service No. 259



# Bay Networks

**SynOptics**  
**WELLFLEET**  
communications

## Largest Inventory of Refurbished Bay Networks in America!

- Bay Networks Trained
- Bay Networks Authorized
- Hundreds of pieces in stock
- New and Used Equipment
- Proven Track Record
- One Year Warranties
- Design and Install Services
- Technical Support

**CABLETRON**  
systems  
The Complete Networking Solution

3Com IBM

MADGE NOVELL

### On-Sight Router Installation

**WE REPAIR ALL BAY NETWORKS!**

**National LAN Exchange 800-243-5267**

1403 W. 820 N. Provo, UT 84601 FAX 801-377-0078 <http://www.nle.com>

C.O.D.'s • VISA • Mastercard • Discover • Terms

Circle Reader Service No. 231

**REFURBISHED**

## NETWORK HARDWARE

**ROUTERS • DSU/CSU • HUBS  
TERMINAL SERVERS • SWITCHES**

**BUY/SELL/LEASE**

**CISCO**

**LIVINGSTON • ADTRAN • ADC/KENTROX  
BAY NETWORKS • 3COM • CISCO**

**800-230-6638**

Fax: 805-964-5649

<http://www.networkhardware.com>

NETWORK HARDWARE RESALE, INC.  
1800 THE STRAND • HERMOSA BEACH, CA 90254

Circle Reader Service No. 244

**REFURBISHED PRODUCTS  
NETWORKING**  
ROUTERS • SWITCHES • HUBS

**CISCO, CABLETRON, SYNOPTICS**

**BAYNETWORKS, CHIPCOM,  
XYPLEX, WELLFLEET, IBM,  
KALPANA, NETWORK, XYLOGICS,  
3COM, DIGITAL, PROTEON,  
MADGE, HP**



NY  
Tel: (315) 458-9606  
Fax: (315) 458-9493  
MA  
Tel: (508) 667-4926  
Fax: (508) 663-0607  
<http://www.bizint.com>

On parle français - Hablamos español - Wir sprechen deutsch

Circle Reader Service No. 219

## NOVELL UPGRADES TO 4.11 INTRANETWARE

5 User.....	\$340
10 User.....	\$575
25 User.....	\$725*
50 User.....	\$975
100 User.....	\$1295*
250 User.....	Call

\*Limited time offer

Netware for SAA v2.0	Microsoft NT Microsoft Office 97
16 sessions..... Call	Call us First!
64 sessions..... Call	We accept
128 sessions..... Call	Government and
254 sessions..... Call	School P.O.s

Check with us for all of your Cisco, 3Com,  
SMC and Shiva hardware needs.

All trademarks and trade names are the property of their respective holders.

**COM 1-800-251-0170**  
**NET** CNE on Staff

Circle Reader Service No. 249

## SAVE 50% & MORE ON MOST PRODUCTS BUY/SELL/NEW/USED

**RENT**  
**Reconditioned With Warranty**

**Multiplexers • T-1/E-1  
CSU/DSU's • Channel Banks**

CSU/DSU, ALL RATE, V.35/RS232.....	\$99
Newbridge Channel Banks.....	\$2995
Micom Marathon 1K,5K,5K Turbo,10K.50% off	
Routers (NEW!).....	\$895
Kentrox T-Serv II.....	\$499
T-1 CSU's.....	\$250
Telco Systems Channel Banks.....	\$2995
Newbridge 3600 Modules.....	CALL
T-1 CSU w/Drop/Insert NEW.....	\$995
Stat Muxes 4, 8, 16, 32, port.....	LOW
T-1 CSU/DSU V.35.....	\$495
Fraction/Full T-1 CSU/DSU.....	\$595
Channel Bank Rentals.....	\$199/month

**METROCOM**  
**THE SUPPLIERS' SUPPLIER**  
(800) 364-8838 or (713) 495-6500  
FAX (713) 495-8449 24 HRS  
[HTTP://www.metrocominc.com](http://www.metrocominc.com)

Circle Reader Service No. 220

## REFURBISHED NETWORKING EQUIPMENT

More than price & availability...  
InterLink Means Customer Satisfaction!

**BUY, SELL, LEASE/RENT, TRADE**  
Routers • Hubs • Bridges • Servers

**CISCO, BAY NETWORKS,  
3COM, DIGITAL, ASCEND,  
LIVINGSTON, XYPLEX**

\*All trademarks are the property of their respective owners

Technical Support • Product Warranty • Aggressive Pricing

**1-800-832-6539**

FAX: 612-944-3534 Email: [sales@interlink.com](mailto:sales@interlink.com)  
Voice: 612-944-3440 <http://www.interlink.com>

**InterLink** COMMUNICATIONS  
7131 SHADY OAK RD; MINNEAPOLIS, MN 55344

Circle Reader Service No. 283

**LAN/WAN • BUY/SELL  
FULLY WARRANTED  
NEW/REFURBISHED  
RENTAL  
LEASE**

**Fibermux AT&T Synoptics**

**CISCO SPECIALISTS**

**Cabletron Bay Networks**  
We carry all manufacturers, call John, ext. 101.

<http://www.psyber.com/~adcs>

**PHONE 800-783-8979**

FAX (916)  
781-6962

**A D C S INC.**

Circle Reader Service No. 240

**Category 5**

### Premium Patch Cords

Our Patch Cords exceed the EIA/TIA 568a specification.

- Contacts: 50m gold platin
- Wire: 24 Awg. stranded, Category 5
- Stranded wire is very flexible
- Molded strain reliefs available
- Available in Black, Ivory, White, Red, Gree, Blue, Yellow, Gray, Hot Pink, Orange & Purple

3 ft .....	1.45
6 ft .....	1.90
10 ft .....	2.50
15 ft .....	3.25
25 ft .....	4.75

In Lots of 5  
11 Colors Available

**ELECTRO PRODUCTS • Call 1-800-423-0646**

Or fax your request to (206) 859-9101

Circle Reader Service No. 246

### Bulk Wire

CAT 5 pvc	AS LOW AS	\$65.00
CAT 5 plenum	AS LOW AS	\$190.00
19" Data Rack		\$126.00

### CAT 5 Patch Panels

12 PORT Mini .....	\$55
24 PORT .....	\$85
48 PORT .....	\$170
96 PORT .....	\$330

All Patch Panels are UL & EIA/TIA Verified

### Outlets

CAT 5 Inserts .....	3.20 ea
Faceplate .....	1.00 ea

### Fiber Optic Cords

5T-ST Duplex 62.5/125 .....	\$23.00
-----------------------------	---------

**For More Information About Marketplace  
1-800-622-1108**

**1-800-AKA-3COM**

**LAN/WAN** **3Com** **NEW/USED**

HUGE INVENTORY

WE TEST ALL PARTS  
BEFORE WE SHIP

"TECK" SUPPORT

AUTHORIZED PRODUCT  
& SERVICE CENTER

QUALITY  
OUR 14<sup>TH</sup>  
YEAR

**LARGEST**

**SUPPLIER**

NEW / USED 3 COM PARTS

<b>SPECIALS</b>	3C509B-TPO.....\$59.ea	3C6022A.....\$600.
	3C509B-COMBO.....\$79.ea	S.M.C. 12-PORT.....\$275.
	3C900-TPO.....\$79.	6-PORT 100BT HUB.....\$495.
	FMS 12-PORT HUB.....\$295.	3C905TX.....\$84.
	FMS 24-PORT HUB.....\$495.	3C250BTX/L.....\$1050.
	FMS2 12/24-PORT.....Call	3C589D-TP.....\$105.
	LANPLEX 2500.....\$2795.	3C16900A.....\$2295.
	NetBuilder2 4-SLOT.....\$1300.	3C16901A.....\$1975.

**ERGONOMIC ENTERPRISES INC.**

47 WERMAN CT. PLAINVIEW, NY 11803

PH: 516-293-5200 FAX: 516-293-5325

visit us at <http://www.800-AKA-3COM.com>

CISCO SYSTEMS CABLETRON SYSTEMS intel IBM Kalpana proteon  
CHIPCOM SynOptics SMC Bay Networks

Circle Reader Service No. 271

## Learn Networking and DataComm at Your Desktop

**Computer Based Training**

- NetWare-Get Certified
- Windows NT
- Data Communications
- LANS & WANS
- Networking PCs
- ISDN, UNIX and much more!!!

**FREE  
DemoDisk**

**ONLY \$495 each**

**LAN & Site Licensing Available**

**ORDER TODAY! 800-253-8379**

Download demo from [www.edutrends.com](http://www.edutrends.com)

Edutrends, Inc. 25 Clifton Rd, Milton, NJ 07438

Circle Reader Service No. 245

**CISCO**  
Systems/Features/Memory

**CISCO**  
**EQUIPMENT**

Also Available: Wellfleet, Bay, Fore,  
Xylogics, Livingston, & Ascend  
In Stock • Fast Delivery • No Expedite Charges

**COMSTAR, INC.**  
The #1 Network Remarketer

**612-835-5502**

Fax 612-835-1927 E-Mail: [sales@comstarinc.com](mailto:sales@comstarinc.com)

Circle Reader Service No. 234

**NEW! NEW! NEW!**

**Fiberdyne Labs, Inc.**

State of the Art  
10 BASE T Ethernet  
RJ45-Fiber Converter  
Model FTX-R11 w/ST's  
and Model FTX-R61 w/SC's



Made in U.S.A.

Qty	Unit Price	
1-5	\$190.00	<b>FACTORY DIRECT SAVINGS</b>
6-20	\$183.00	
21+ Call (800) 894-9694		

**AFIBERDYNE LABS, INC.**

818 Park Lane Dr., Herkimer, NY 13350  
[www.fiberdyne.com](http://www.fiberdyne.com)

Circle Reader Service No. 291



NSI

Continued from page 1

whisks you off to an online shopping service. Replacing .com with .net doesn't help.

Or maybe you'd try a search engine. AltaVista and Excite quickly churn out links to Fiber Network Solutions, Inc. and Key Network Solutions, Inc. — but there's no sign of NSI in the first 40 entries.

### LOST IN THE WEB

"Navigating the Web," a report issued by Cambridge, Mass.-based Forrester Research discovered the following about searching the Web:

- Finding relevant information is too difficult.
- Specific sites are hard to locate.
- Major search engines can't keep up with growth.
- Multimedia, dynamic Web pages are making sites too complex to index.

Search engines are trying to solve the problems. Here's how Forrester said they stack up:

Company	Search features	Comments
Yahoo!	B+	800-pound gorilla of navigation
Excite	B	Making the right moves
Others	B-	Infoseek and Lycos are second-tier

Based on interviews with 15 consumer-oriented Web sites and more than 35 other vendors.

The address, it turns out, is [www.netsol.com](http://www.netsol.com). "Like a lot of companies, we're not listed under our literal name," says NSI spokesman Christopher Clough.

NSI is far from alone. From Cascade Communications Corp. ([casc.com](http://casc.com)) to Southwest Airlines Co. ([iflyswa.com](http://iflyswa.com)), plenty of companies have hard-to-guess Internet addresses. The problem is particularly acute for companies with common names, such as "United," which could mean anything from United Airlines, Inc. to United Van Lines, Inc.

Indeed, despite an array of sophisticated search engines, it often seems maddeningly difficult to quickly track down resources on the 'Net.

And little wonder why. Internet experts often point out that the Domain Name System (DNS) was never designed to be a directory service; it simply was intended to look up IP numbers under the assumption that users already knew the full URL.

Plus, addresses often change, and Webmasters have no standard way to describe their content. Then there are "hostile

Web authors" who try to fool search engines into making their sites appear more frequently.

"It's obviously a big problem, and it's a problem that has been fueled by the growth in Web sites," said Graham Spencer, chief technology officer for the search engine company, Excite, Inc.

To be sure, savvy surfers usually can track down the information eventually. But many believe the process could be improved.

"Right now, [it's] similar to putting all the street names in the U.S. into one big database and returning thousands of hits for Oak Street," said William Chen, a network manager at Columbia University's Academic Information Services unit. "Then [consider] some of those Oak Streets . . . may not exist anymore."

But plenty of people are working on solutions. Some examples:

- Dun & Bradstreet Corp. has built a directory of company names. Type in the company name, and you'll receive a list of URLs and other information. But the directory doesn't include non-profits organizations or individuals.

- NSI is testing a Java applet that lets you type in a name and it sends you a list of all related domain names. The database, however, doesn't include all specific URLs or country domains.

- Excite has entered thousands of company URLs into its database. Type in a major company and you will likely get a link to the company home page at the top. But smaller companies are still hard to find.

- A start-up called Network LLC, of Arlington, Va., has created a database with thousands of keywords tied to specific Web pages. Seagate Technology, Inc. just paid thousands for 500 "Networks," such as "Seagate ST52160N," that point to product specs. But the database is far from complete.

Network plans eventually to charge for all keywords.

- Academics have proposed protocols to help Web site opera-

tors better describe their pages. Currently, search engines must tediously index sites by hand or use robots to simply collect a list of keywords that users can search. The main proposals are called the Dublin Core and Warwick Framework.

- The Internet Engineering Task Force (IETF) is considering a proposal to reduce broken links.

Uniform Resource Names (URN) would be codes for enduring resources, such as the Bible or historical documents, that might eventually change servers or URLs.

When an end user enters a URN, the browser checks a DNS-like system to find the closest or most current URL.

Still, if the DNS was never designed to be a directory service, some observers wonder why the IETF has not created one.

"It's not a technical problem," says Keith Moore, the IETF's applications area director. "You could do it with existing protocols."

Indeed, programmer Daniel Liberte, who has actively followed the URN debate, hopes a company will take existing trademark databases and match them all to URLs. That way, anyone looking for a name or product could quickly find an official Web site. But the database would be so massive, no one has even attempted it.

"There's no magic bullet," Columbia's Chen says. ■

### NOT WHAT THEY APPEAR TO BE

While the following URLs might appear to be those of some well-known network industry players, they aren't.

**[www.cascade.com](http://www.cascade.com)**  
Cascade Wholesale Hardware, Inc., not Cascade Communications Corp. ([www.casc.com](http://www.casc.com))

**[www.bay.com](http://www.bay.com)**  
Bay Resources, Inc., not Bay Networks ([www.baynetworks.com](http://www.baynetworks.com))

**[www.networksolutions.com](http://www.networksolutions.com)**  
Internet Mall, not Network Solutions, Inc. ([www.netsol.com](http://www.netsol.com))

**[www.united.com](http://www.united.com)**  
Nothing. Not United Airlines, Van Lines, etc.

**[www.altavista.com](http://www.altavista.com)**  
AltaVista Technology, Inc., not Digital's AltaVista ([www.altavista.digital.com](http://www.altavista.digital.com))

**[www.iana.org](http://www.iana.org)**  
Information Sciences Institute, not the Internet Assigned numbers ([www.isi.edu/div7/iana/](http://www.isi.edu/div7/iana/))

Get more information online at  
[www.nwfusion.com](http://www.nwfusion.com)  
DocFinder: 2514

## NetPCs

Continued from page 1

have on corporate networks. Users and even some NetPC vendors seem unconvinced these devices will play a huge role.

"We're interested in the NetPC concept," said Winn Stephenson, vice president of network computing at Federal Express Corp., which is looking to reduce the costs of managing its 20,000 Windows PCs. "But we need to see one of them and see that it has some real definition."

"Most of the NetPC features are either ones we've had in our PC product line or have had to an extent," said Michael Takemura, product

marketing manager with Compaq Computer Corp., which will show off its early NetPCs here.

One reason for this subdued outlook is that the main problem NetPCs are designed to attack — making Windows PCs much easier to use and less costly to manage — is being addressed by PC vendors in their existing product lines.

At best, NetPCs will promote a uniform way of managing cross-platform desktop devices. But eventually, corporate customers can expect to see these capabilities built into all PCs whether they carry a NetPC label or not.

"The NetPC camp is trying to lower the cost of [PC] ownership by moving to server-based administration," said James Eibisch, senior analyst in the London office of Input, a market research company. "But if you buy into the NetPC idea as the next upgrade, you don't have the choice of clients you would have if you move to a more open client like Java."

### On display

NCs, which promise similar management benefits, have already been released by companies such as IBM. But stories surfaced last week that NC software from Corel Corp. and hardware from Sun Microsystems, Inc. will be delayed.

The NetPCs on display Monday will generally feature Pentium or Pentium II processors and run Windows.

They will have hard drives for storing the operating system and downloaded applications, but lack floppy or CD ROM drives. The chassis can be sealed to prevent end users from add-

ing or removing components.

"We took a PC and designed it from the ground up to be centrally managed," said Ron Peck, director of net client marketing for Intel. "End users retain all their PC software capabilities, while MIS controls what applications are placed on the client. And we give them the ability to quickly change what's on the client."

In addition to NetPC desktop devices, a slew of NetPC management servers will be on display at PC Expo.

*"We need to see one of [the NetPCs] and see that it has some real definition," says Federal Express' Winn Stephenson.*

They will include software for configuring, monitoring and managing NetPCs. These tools will let MIS managers watch over inventory of NetPCs and decide what applica-

tions end users can download.

But when NetPCs will deliver the goods is still an open question. The critical parts of the NetPC are the server software and management applications, and they are not mature yet.

In addition, NetPCs will really only flower with the next release of Windows NT 5.0 this year or early in 1998. Version 5.0 will support Microsoft's Zero Administration Initiative for simplifying remote management.

If everything comes together, big customers such as Federal Express may be willing to buy in.

"We will look at NetPCs in conjunction with [NCs and] the other solutions we're considering," Stephenson said.

But the company first needs to create a new method of accurately figuring out what thin clients and other new desktop devices will actually cost to deploy and run, he said.

Dell Computer Corp. is among the vendors optimistic that customers will buy into NetPCs. "We estimate NetPCs will be about 10% to 15% of the total [PC] client base," a company spokesman said. ■

## CORRECTIONS

In the Videoconferencing endpoint products Buyer's Guide chart (May 19, page 46-49), *Network World* left out Wintronix, Inc.'s XtX Internet Communications Suite 1.2 product. You can now find it in the online chart on Network World Fusion ([www.nwfusion.com](http://www.nwfusion.com), DocFinder 2021).



## NETWORK WORLD, INC.

THE MEADOWS  
161 WORCESTER ROAD, FRAMINGHAM, MA 01701-9172  
(508) 875-6400/FAX: (508) 879-3167

Colin Ungaro, President/CEO  
Evelie Thibeault, Senior Vice President/Publisher  
Mary Kaye Newton, Assistant to the President  
Eleni Brisbois, Sales Associate

### ADMINISTRATION

Mary Fanning, Vice President Finance and Operations  
Frank Coelho, Office Services Manager  
Paul Mercer, Billing Manager  
Mary Rinaldo, Telecommunications Administrator  
Tom Garvey, Mailroom Supervisor  
Tim DeMeo, Mailroom Assistant

### HUMAN RESOURCES

Mary Cornetta Brown, Vice President, Human Resources  
Danielle Volpe, Human Resources Representative

### MARKETING

Virginia Lehr, Director of Marketing  
Kristin Watt, Marketing Communications Manager  
Barbara Sullivan, Market Research Analyst  
Heidi Creighton, Public Relations Manager  
Donna Kirkey, Marketing Design Manager  
Nancy Vickers, Graphic Designer

### GLOBAL PRODUCT SUPPORT CENTER

Joanne Wittren, Senior Global Marketing Services Manager

### ADVERTISING OPERATIONS

Karen Wallace, Director of Advertising Operations  
Ann Jordan, Senior Advertising Account Coordinator  
Mario Matoska, Advertising Account Coordinator  
Sean Landry, Direct Response/Recruitment Ad Coordinator

### PRODUCTION

Ann Finn, Production Director  
Greg Morgan, Production Supervisor  
Cathy Sampson, Print Buying Supervisor

### RESEARCH

Ann MacKay, Research Director

### CIRCULATION

Sharon Smith, Senior Director of Circulation  
Richard Priante, Director of Circulation  
Bobbie Cruse, Assistant Circulation Director  
Mary McIntire, Circulation Assistant

### IDGLIST RENTAL SERVICES

Christine Cahill, Sales Representative  
P.O. Box 9151, Framingham, MA 01701-9151  
(800) 343-6474/(508) 370-0825, FAX: (508) 370-0020

### PROFESSIONAL DEVELOPMENT GROUP

William Reinstein, Senior Vice President/Business Development  
Debra Becker, Marketing Manager  
Christie Sears, Finance/Operations Manager  
William Bernardi, Senior Product Specialist  
Peter Halliday, Product Manager/NetDraw  
Andrea D'Amato, Sales Manager/Strategic Partnerships  
Sharon Schawbel, Product Specialist  
Betty Amaro, Operations Specialist

### ONLINE SERVICES

Ann Roskey, Director, Online Services  
Jean-Olivier Holingue, Web Technology Manager  
Pam Kerensky, Web Operations Specialist  
FAX: (508) 820-1283

### INFORMATION SYSTEMS/ DIGITAL IMAGING SERVICES

Michael Draper, Vice President Information Systems  
Jack McDonough, Director of Systems and Technologies  
Rocco Bortone, Network Administrator  
Anne Nickinello, Digital Imaging Manager  
Deborah Vozikis, Imaging Specialist  
FAX: (508) 875-3090

### DISTRIBUTION

Bob Wescott, Distribution Manager  
(508) 879-0700

## IDG

**Patrick J. McGovern**, Chairman of the Board **Kelly Conlin**, President **Jim Casella**, Chief Operating Officer **William P. Murphy**, Vice President Finance  
*Network World* is a publication of IDG, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. IDG publishes over 275 computer publications in 75 countries. Ninety million people read one or more IDG publications each month. *Network World* contributes to the IDG News Service, offering the latest on domestic and international computer news.

## SALES OFFICES

### Carol Lasker, Advertising Director

Internet: clasker@nww.com  
Debbie Lovell, Sales Associate  
(508) 875-6400/FAX: (508) 628-3976

### NORTHEAST

Tom Davis, Eastern Regional Manager  
Aimee Damiani, Sales Assistant  
Donna Pomponi, Senior District Manager  
Nancy Robinson, Senior District Manager  
Elisa Scheuermann, District Manager  
Michael Eadie, Account Executive  
Internet: tdavis, dpomponi, nancyr, elisas, meadie@nww.com  
Jolene Springfield, Sales Assistant  
(508) 875-6400/FAX: (508) 628-3976

### MID-ATLANTIC

Jacqui DiBianca, Senior District Manager  
Rick Groves, District Manager, Sales Manager IntraNet Magazine  
Internet: jdibian, rgroves@nww.com  
Barbara Stewart, Sales Assistant  
(610) 971-1530/FAX: (610) 975-0837

### MIDWEST

Bob Mitchell, District Manager  
Internet: bmitchel@nww.com  
Anna Caran, Sales Assistant  
(847) 297-8855/FAX: (847) 827-9159

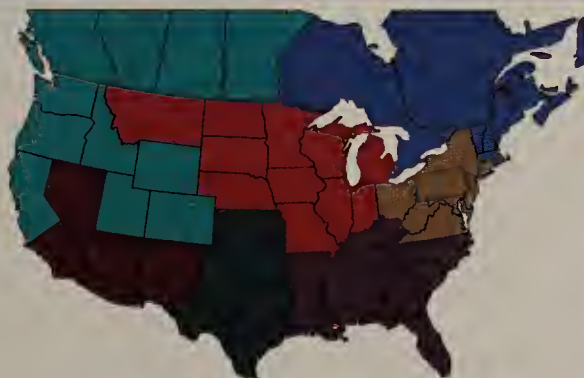
### CENTRAL

Dan Gentile, Midwest Regional Manager  
Internet: dgentile@nww.com  
Anna Caran, Sales Assistant  
(512) 246-7044/FAX: (512) 246-7703

### NORTHWEST

Sandra Kupiec, Western Regional Manager  
Paula Connor, Senior District Manager  
Susan Rastellini, District Manager  
Kevin Octavio, District Manager  
Carol Stiglic, District Manager  
Drew Camard, District Manager  
Internet: skupiec, pconnor, slr, koctavio, cstiglic, dcamard@nww.com

Mandy Tiedje, Sales Assistant  
Brenda Mays, Sales Assistant  
(408) 567-4150/FAX: (408) 567-4166



### SOUTHWEST

Amy C. Bartulis, Senior District Manager  
Internet: abartuli@nww.com  
Tracy Pennell, Sales Associate  
(714) 250-3006/FAX: (714) 833-2857

### SOUTHEAST

Don Seay, Senior District Manager  
Internet: dseay@nww.com  
Terry Sanders-Prentice, Sales Assistant  
(770) 394-0758/FAX: (770) 394-6354

### DIRECT RESPONSE ADVERTISING Response Card Decks/Marketplace

Joan Bayon Pinsky, Director Direct Response Advertising  
Clare O'Brien, Sales Manager  
Richard Black, Account Executive  
Heather Fairbanks, Account Executive  
Enku Gubaie, Account Executive  
Internet: jpinsky, cobrien, rblack, hfair, egubaie@nww.com  
Sharon Chin, Sales/Marketing Operations Coordinator  
Chris Gibney, Sales Assistant  
(508) 875-6400/FAX: (508) 628-3976

### RECRUITMENT ADVERTISING

Pam Valentinas, Director of Recruitment Advertising  
Internet: pamval@nww.com  
Carla Cappucci, Sales Associate Central U.S. Territory  
(508) 875-6400/FAX: (508) 820-0607

## EDITORIAL INDEX

3Com.....	6,19,46
<b>A</b>	
AT&T.....	6,32
AT&T WorldNet.....	1
Axent.....	35
<b>B</b>	
Bay.....	46
B&N Planet.....	1
Bell Atlantic.....	32
BellSouth.....	1
Borland.....	41
BT.....	31,32
Business Objects.....	35
Bus-Tech.....	12,73
<b>C</b>	
Cabletron.....	46
Cisco.....	1,12,25,32,46
CMS Enhancements.....	19
Comcast.....	12,31
Compatible.....	25
CyberMedia.....	22
<b>D</b>	
Dataware.....	42
Digitivity.....	1
<b>E</b>	
enCommerce.....	37
Excalibur.....	42
Excite.....	1,74
<b>F</b>	
Fabrik.....	35
Falcon.....	55
Fulcrum.....	42
<b>G</b>	
GeoTel.....	31
GTE.....	1
<b>H</b>	
HP.....	22
<b>I</b>	
IBM.....	6,16,35
IDI.....	42
Intel.....	1
InterDigital.....	31
Intergraph.....	22
Intuit.....	74
Invincible.....	55

<b>J</b>	
Jetstream.....	1
<b>L</b>	
LANart.....	25
Lotus.....	16
Lucent.....	74
<b>M</b>	
McAfee.....	35
MCI.....	31
Memotec.....	26
Micom.....	74
Micropath.....	58
Microsoft.....	1,6,12,19,22,31,73
<b>N</b>	
NetOne.....	19
Nets.....	35
Netscape.....	6,8,22
NetSpeak.....	74
Network.....	1
Network Appliance.....	55
Network Solutions.....	1
Nortel.....	31
Novell.....	6,73
NYNEX.....	32
<b>O</b>	
Oracle.....	8,58
<b>P</b>	
Pacific Bell.....	1
Perot Systems.....	35
PointCast.....	22
Prominet.....	19
<b>S</b>	
SBC.....	6,32
Skystone Systems.....	25
South Wind Design.....	25
StrataCom.....	32
Sun.....	19
<b>U</b>	
U.S. Robotics.....	6,25
<b>V</b>	
Verity.....	42
Vienna Systems.....	74
Vocaltec.....	74
Voxware.....	74

## ADVERTISER INDEX

Advertiser.....	Reader Service#.....	Page#.....	
3Com.....	10-11	68	Network Instruments..... 290..... 68
AbirNet.....	305	66	*Network Peripherals..... 20..... 59
Allegro Group.....	303	67	Osicom Technologies..... 5..... 26
Amco Engineering Company.....	264	66	Procom Technology..... 13..... 23
American Power Conversion.....	1	9	PSI..... 18..... 7
AMP Inc.....	6	75	Racpre Corp..... 281..... 63
Arescom Inc.....	284	64	RAD Data Communications..... 14..... 34
Async Technologies.....	242	66	RADCOM..... 295..... 64
Auspex.....	7	36-37	Rose Electronics..... 289..... 63
Avalan Technology.....	276	64	Solunet Inc..... 298..... 64
Bay Networks.....	2	40	Sprint..... 76
Castle Rock Computing.....	252	63	Standard Microsystems..... 15..... 33
Cisco Systems.....		13	Tandem Computer..... 24
Compaq Computer Corp.....	14-15,43		TCG..... 16..... 38
CR Systems.....	267	66	Telecommuting & Home Office Expo..... 58
CrossTec Corp.....		32	TODD Enterprises Inc..... 266..... 66
Cubix Corp.....	8	57	Transcender..... 222..... 68
Dataprobe Inc.....	285	68	Tron International..... 233..... 67
*Dell Computer Corp.....	28-29		USA Communications..... 258..... 68
Digital Equipment Corp.....	3	17,39,41	Wright Line..... 287..... 65
Distinct Corp.....	268,273	67	
Hitachi internetworking.....	9	27	<b>Network World Fusion - www.nwffusion.com</b>
HT Communications.....	229	68	3Com (2) Hitachi Internetworking Network Appliance
IBM.....	2-3,30		Anixter IBM (2) Shiva
Innospft International.....	10	22	Ascend LanOptics Unisys
M.E.N.....		73	Compuware Make Systems US Robotics
MCI Communications.....	11	4	Exide Microsoft (2) US Web
Micom Communications.....	12	50	Global Internet Netscape (2) US West
Microsoft.....	20-21		Utopia Partners
NEC.....	22	48-49	
NBase Switch Communications.....	21	59	
Netaccess.....	4	53	
NetManage Inc.....	19	16	

These indexes are provided as a reader service. Although every effort has been made to make them as complete as possible, the publication does not assume liability for errors or omissions.

\*Indicates Regional/Demographic

## DIRECTORY OF SERVICES

## NetworkWorld TECHNICAL SEMINARS

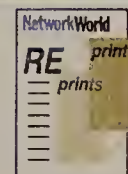
Network World Technical Seminars are one and two-day, intensive seminars in cities nationwide covering the latest networking technologies. All of our seminars are also available for customized on-site training. For complete and immediate information on

our current seminar offerings, dial our instant fax-back service at 800-756-9430 from your touch tone phone or call a seminar representative at 800-643-4668.

## NetDraw

software. At your fingertips, you will find over 1,700 full color network images, many the exact replicas of manufacturer-specific equipment. New in NetDraw Plus v3.0 are library search by keyword to speed access to the right image, the ability to attach text to lines, full image rotation, custom zoom level for exact frame of reference and way more! Call 800-643-4668 to order your copy today for only \$149! Or get immediate fax-back information by dialing 800-756-9430 and request document code #10.

Create diagrams, proposals and network upgrade "what-if" scenarios fast and easily with Network World's NetDraw and NetDraw Plus



Publicize your press coverage in *Network World* by ordering reprints of your editorial mentions. Reprints make great marketing materials and are available in quantities of 500 and up.

To order, contact Reprint Services at 612-582-3800 or 315 5th Ave. N.W., St. Paul, MN 55112.

\*Our instant fax-back service delivers information on many of these products. Dial 800-756-9430 from your touch tone phone and use the appropriate document code to have information faxed right back to your fax machine!



## WorldNet

Continued from page 1

BBN Planet's Internet backbone to support its WorldNet MIS users since August 1995. But the relationship between AT&T and BBN has been shaky since AT&T rival GTE Corp. announced its intention to acquire BBN Corp., the ISP's parent (NW, May 12, page 8).

AT&T declined an interview, but the company is transitioning customers to its own IP backbone, said James Olson, national marketing director for AT&T's MIS. AT&T's ultimate goal when it signed with BBN Planet was to eventually support its WorldNet business users independently. AT&T needed to work with an established Internet service provider like BBN Planet to get into the dedicated Internet access market quickly. But analysts believe AT&T put its independence day plan into high gear once GTE stepped into the picture.

Now that AT&T is bringing new WorldNet MIS customers onto its own network, analysts wonder if AT&T is ready to sup-

port business-quality dedicated 'Net access. The move may leave AT&T dedicated 'Net access customers with service that lacks adequate security, network guarantees and global support.

Although analysts agree AT&T has the network capacity to handle all its business users, the question remains as to whether they have the Internet and marketing know-how to keep them.

AT&T's vast voice and data networks have won over customers for the telecom giant. But do not be fooled — business-class Internet access is a new area for AT&T, said Rebecca Wetzel, director of Internet services at TeleChoice, Inc., a Verona, N.J.-

based consultancy.

AT&T has some hurdles it must overcome to offer business users high-quality service, said Barbara Ells, an industry analyst at consulting firm Zona Research. For example, existing WorldNet MIS users benefit from standard BBN practices such as guaranteed 99.9% network availability. Users also can sign up for SitePatrol, BBN's managed firewall service, Ells said. These are capabilities AT&T does not offer, she said.

Without a firewall service plan, users would be required to bring that function in-house. That is a big deal especially if they are already using SitePatrol. Net availability guaran-

tees are also important any time the Internet is involved because the 'Net does not have the reputation of being highly reliable.

Security is the No. 1 issue AT&T needs to address, especially given the "protective service BBN offers," Zona

Research's Ells said.

Although it seems AT&T has a lot on its plate, some users look forward to using the revamped WorldNet MIS service.

PMI Mortgage Insurance Co., a San Francisco-based insurance company, has been waiting for AT&T to move its Internet support in-house because "AT&T can give us a direct line to the

Internet," said Jim Fey, manager of technical services. PMI has a dedicated T-1, 1.544M bit/sec, Internet access connection through a reseller and is not pleased with the performance. ■

Get more information online at  
www.nwfusion.com.  
DocFinder: 2516

## Digitivity

Continued from page 1

Java now uses a "sandbox" model to restrict applets to browsers, but the technology is evolving so "signed" applets can access system resources. Companies are concerned about hostile applets as well as buggy code that could foul up an intranet. Some firms have even gone so far as to use firewalls to screen out Java applets.

Digitivity's CAGE software, which would typically sit on a server in front of a firewall, provides a way to capture, manage and centrally run Java applets in a manner transparent to end users whose computers are outfitted with standard Java browsers.

Digitivity, a unit of APM, Ltd. in Cambridge, England, came up with CAGE on behalf of Swiss Bank's Warburg stock-trading subsidiary in London. Warburg has deployed a system to let its brokers download Java applets to conduct stock trades electronically.

CAGE software provides a security framework that minimizes the risk posed by Warburg brokers accepting downloadable, executable code off the Internet.

CAGE software implements the same sort of Java Virtual Machine (JVM) that Web browsers use, said Andrew Herbert, Digitivity's chief technology officer. The JVM defines a standard way to run applets.

With CAGE, the moment an end user types in a URL for an applet, the request is recognized by Digitivity's AppRouter proxy software, which sits on the corporate firewall. AppRouter opens a remote window from the user's browser to the CAGE server by means of Digitivity's browser bridge protocol.

The user actually ends up downloading a kind of substitute applet, which notifies the CAGE server of the real Java applet the

user wants to run, Herbert said. The CAGE server then runs the Java applet remotely for the user. "This way, managers can monitor [the Java applet]," he said. "The chance of someone sending you a buggy applet is really quite high."

Running on Windows NT or Solaris, each CAGE server can support as many as 1,000 simultaneous users, said Andi Bruno, director of marketing at Digitivity.

In addition, the CAGE server can cache trading partners' Java applets so the applets do not have to be repeatedly down-

## PROFILE: DIGITIVITY, INC.

**Founded:** January 1997

**Based:** Los Altos, Calif.

**Management:** Scott Metcalf, CEO, previously of HAL Computer Systems, Unisys and Sun; Andrew Herbert, chief technology officer

**Funding:** Privately held; raised \$5.5 million in investment funding

**Product family:** CAGE Application Management System, software that helps companies securely manage Java applets

loaded. Users should not have to worry about cached Java applets growing outdated because the Internet's HTTP protocol is designed to check the timestamp on the URL's sources even when the page is cached, Herbert said.

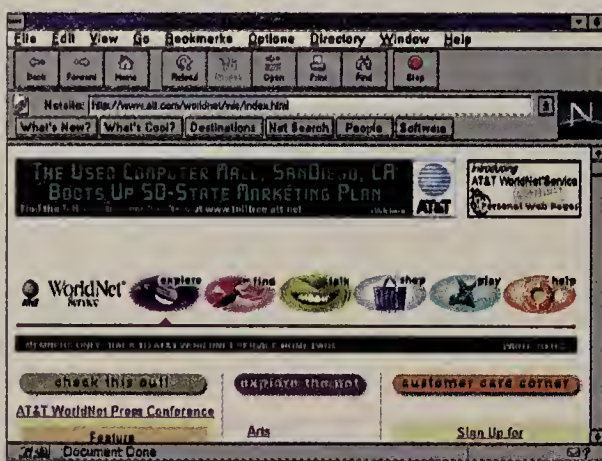
CAGE impressed Michael Goulde, a senior consultant at Boston-based consultancy Patricia Seybold Group, Inc. The product presents a safe and scalable approach to running Java applets, he said.

In September, Digitivity will augment CAGE with its second product, the Policy CAGE, which can route a Java applet based on signature or source.

The CAGE Applet Management System, available now, starts at \$7,500 for 25 users.

© Digitivity: (415) 947-1904

Get more information online at  
www.nwfusion.com.  
DocFinder: 2513



## ISDN

Continued from page 1

moted this week by carriers and hardware vendors at the North American ISDN Users Forum and ISDN World here, would let users run e-mail and other low-speed applications on the 16K bit/sec D channel. This channel is capable of moving about 9.6K bit/sec of X.25 packet data while also handling its conventional signaling chores.

Today, most ISDN customers send data over one or both 64K bit/sec Basic Rate Interface B channels only, regardless the transfer size. The drawback for customers is that many carriers bill for B channels by the minute.

With AO/DI, one or both B channels can be turned on when really needed, such as to support videoconferencing or other high-bandwidth applications.

When a remote end user with AO/DI hardware logs on to his or her terminal, the AO/DI gear would establish a switched virtual circuit (SVC) connection to the corporate network or an Internet service provider that also supported AO/DI. The SVC would stay nailed up until the customer logs off, allowing the customer to receive data forced along by push technology or access the corporate LAN.

Using the D channel to send data is not an entirely new concept. However, the hardware that currently supports D chan-

nel data communications is geared specifically to connecting retailers to banks for credit card checks.

The service is priced on a per-packet basis that would prove prohibitive to users of most other applications.

Rewriting the tariffs that set the price for sending packet data over the D channel will determine the success of AO/DI, according to Jim Bryce, a member of the Texas ISDN Users Group.

Most of the regional Bell operating companies said they were working on pricing, and some expected to have new tariffs filed by the end of the year, around the time hardware vendors figure they will have AO/DI-compliant gear ready.

BellSouth Corp. will run trials later this month in Birmingham, Ala., using Cisco Systems, Inc. equipment to determine the impact that widespread use of AO/DI would have on BellSouth's packet- and circuit-switched networks.

Pacific Bell has plans to offer an ISDN hardware/service bundle. ■

**Network World**, 161 Worcester Road, Framingham, Mass. 01701-9172, (508) 875-6400

Periodicals postage paid at Framingham, Mass., and additional mailing offices. Postmaster: Canadian International Publication Agreement #0885662. *Network World* (ISSN: 0887-7661) is published weekly, except for a single combined issue for the last week in December and the first week in January by Network World, Inc., 161 Worcester Road, Framingham, Mass. 01701-9172.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject nonqualified requests. Subscriptions: 1-508-820-7444.

Nonqualified subscribers: \$5.00 a copy; U.S. - \$95 a year; Canada - \$117.70 (including 7% GST, GST #126659952); Central & South America - \$110 a year; Europe - \$165 a year; all other countries - \$245 a year (annual service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label from front cover of the publication.

*Network World* can be purchased on 35mm microfilm through University Microfilms Int., Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106.

*Network World* is distributed free of charge in the U.S. to qualified management or professional who meet ALL of the following criteria:

- 1) Have site purchasing influence.
- 2) Are involved in the purchase of network products and services.
- 3) Have multipplatform networks installed or planned (including network architectures, LAN operating systems and LAN environments).

**PHOTOCOPY RIGHTS:** Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by Network World, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus 50 cents per page is paid to Copyright Clearance Center, 27 Congress Street, Salem, Mass. 01970.

**POSTMASTER:** Send Change of Address to *Network World*, P.O. Box 5090, Northbrook, IL 60065.

Copyright 1997 by Network World, Inc. All rights reserved. Reproduction of material appearing in *Network World* is forbidden without written permission.



Reprints (minimum 500 copies) and permission to reprint may be purchased from Reprint Services, 515 5th Ave. N.W., St. Paul, MN 55112 (612) 582-5800.

USPS 735-730

Get more information online at  
www.nwfusion.com.  
DocFinder: 2515



# Bus-Tech hypes high-tech mainframe hooks

By Michael Cooney  
Burlington, Mass.

Bus-Tech, Inc. next week will roll out a family of mainframe channel connectivity products aimed at helping users gain

high-speed access to data center resources.

The NetShuttle family of mainframe channel connectivity devices will let users tie Ethernet, token-ring and FDDI LANs

supporting SNA, TCP/IP and IPX traffic directly to the mainframe without requiring expensive front-end processors, LAN gateways or routers.

"NetShuttle products will help users

collapse their backbones while at the same time simplifying data center connectivity," said Al Brandt, vice president and general manager of the NetShuttle product line.

According to industry experts, channel-attaching LAN and other communications equipment directly to the mainframe saves money by consolidating multiple gateways and reducing the need for front-end processors.

It also is an easy way to bring TCP/IP nets to the mainframe — especially important with the advent of corporate intranets.

According to the Xephon, Ltd. consultancy survey of 270 mainframe sites, some 25% already had an intranet and 75% said they would have one by year-end.

"Data center administrators want control over the mainframe-to-network connection, and channel-attached devices give that to them," said Anura Guruge, an independent analyst based in New Ipswich, N.H.



NetShuttle will compete with Cisco and others, says Bus-Tech's Brandt.

## The NetShuttle family

The seven-member NetShuttle family is built on a 166-MHz Intel-based chassis and PCI-based adapters.

The scalable family spans the connectivity gamut from the entry-level Model 110, a single Ethernet-to-parallel mainframe channel box, to the top-of-the-line Model 230.

The 230 supports two parallel and fiber-based Enterprise Systems Connection mainframe channels, four LAN ports, a tn3270E gateway for SNA connectivity over IP-based nets and a Web server function. The boxes scale to support as many as 2,000 users and 4,000 SNA or TCP/IP sessions.

In addition, all 2XX-level NetShuttles support IBM's Host-on-Demand, a Java-based package that lets 3270 users gain access to SNA applications over the Internet.

Other NetShuttle models are targeted at specific server environments.

For example, Model 210 includes a Novell, Inc. NetWare for SAA gateway and IntranetWare support allowing NetWare users fast access to mainframe resources. Model 220 runs Microsoft Corp.'s Windows NT, SNA Server and Internet Information Server, allowing Microsoft users easy mainframe access.

The ability to combine the integrated NT, NetWare and intranet capabilities of Host-on-Demand are what attracted Fuji Photo Film USA, Inc. to NetShuttle.

Bill Dutcher, senior technical support specialist for the firm, said NetShuttle would simplify and accelerate the company's Intranet-to-mainframe implementation.


The NetShuttle products are available now for prices ranging from \$10,000 to \$28,000 depending on configuration.

© Bus-Tech: (800) 284-3172


**NetworkWorld's**

# MANAGING ENTERPRISE NETWORKS & SYSTEMS CONFERENCE

**BOSTON • JULY 29-31, 1997**

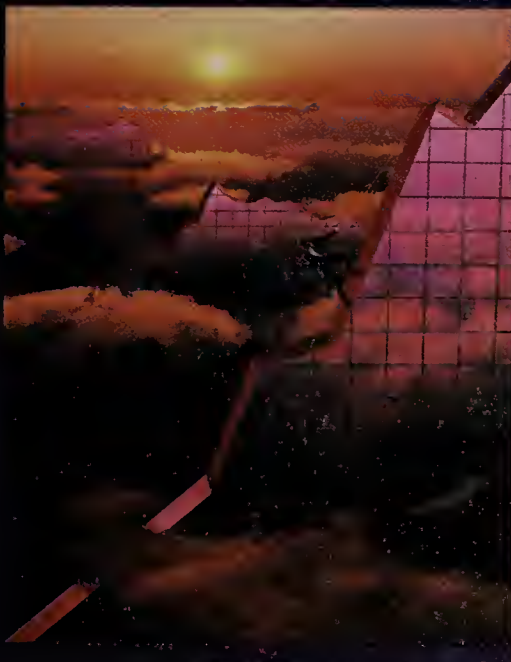


**Web Management—**  
**Are you Prepared?**



**Zero Administration—**  
**Are you Close?**

**Service Levels—**  
**Are you able to Deliver?**





**SPECIAL KEYNOTE PRESENTATIONS BY:**  
 Frank Moss, *President and CEO, Tivoli Systems*  
 Russell Artzt, *Co-Founder/VP of Technology, Computer Associates*  
 Joseph A. Marengi, *President and COO, Novell*  
 Olivier J. Helleboid, *General Manager, Hewlett Packard*  
 Lloyd Carney, *Executive Vice President, Bay Networks*


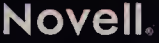


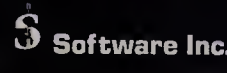





**CONFERENCE CHAIRMEN:**  
 Rick Villars and Paul Mason, *International Data Corp.*

Call (508) 470-3880 for more information or visit our web site at [www.dciexpo.com](http://www.dciexpo.com). Please mention priority code RWAWN05, when calling

**CONFERENCE SPONSORS:**

**CONFERENCE CO-SPONSORS:**

cover photos: ©TSM/Ron Lowery, William Whitehurst, 1997



## The barbarous fashion of the network biz

*"Fashion is something barbarous, for it produces innovation without reason and imitation without benefit."*

— George Santayana, philosopher and poet, "The Life of Reason"

Fashion, whether we're talking clothes or computers, is fascinating. It is a fundamental attribute of the structure of our culture. Indeed, it arises out of the communications of tens of thousands of individuals and creates an important part of the context of our public discourse.

Perhaps nowhere are the attributes of fashion more instantly recognizable than in the garment and cosmetics world — the real fashion business. In fashion, we see hems go up and down while colors and looks come "in" and go "out," driven by the season.

By the way, I have a theory. You know that color taupe? I bet that most of the guys out there are saying something like "sorta" while every woman is saying, "Yep, it's that color that is like..." My theory is that men are genetically incapable of perceiving taupe as a distinct color, they see it as just another shade of brown. It's a sort of specialized color blindness. But I digress.

*Call me old-fashioned, but those people look and sound to me like they need serious psychiatric help.*

Because of fashion, we see models rise to superstardom; they have some quality that is "hot." If I may digress again, could someone please explain Kate Moss to me? What is it about an anorexicly thin, sulky-faced, apparently prepubescent girl that makes her a fashion icon? And those Obsession advertisements! Call me old-fashioned, but those people look and sound to me like they need serious psychiatric help.

Anyway, my topic for this week is fashion and the computer business. Over the past few years, we've seen a slow but steady move away from conservatism in our industry.

Once upon a time, when the computer industry was all about big iron — when mainframes ruled the earth (and incidentally,

when voluptuousness was "in" fashion) — and computer fashion didn't exist.

Then along came PCs. As soon as they grew into a consumer business — pretty much after the emergence of the IBM AT — fashion started to emerge. For a long time, the colors were all that maggot shade of

cream, but we finally saw black creep in from Compaq, NeXT and others. And then a few years later, Sun produced the Indigo in, guess what color?

That was only the hardware. We also have seen software fashions evolve.

There's been the changing fashions of user interfaces starting with DOS, then DOS with menus, then Macintosh, and all of the variations of Windows, the pen interfaces and others.

But nowhere do we find fashion evolving with such wild abandon as in today's network technologies. And what is it that has accelerated the rate of digital fashion change? Two words: The Internet.

The 'Net has given us the greatest mechanisms ever invented for communication and, by God (or maybe "by Moore"), do we use them. We rave to each other about new technologies and implementations and devote acres of squashed dead trees smeared with ink to analyzing, extolling, criticizing and then eviscerating them when they finally fail or are superseded.

In this market, we're so hungry for novelty and cleverness for new fashions, we accept the inevitable chaos of "beta du jour." Accept! We can hardly contain our desire to get our hands on the next release. We salivate. We lust. And we pay dearly for it.

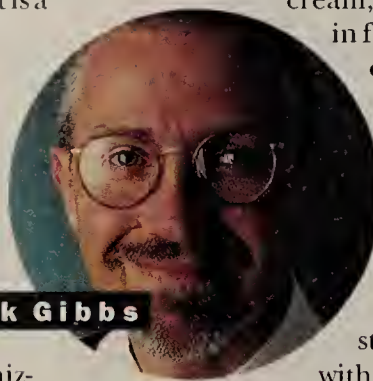
We operate on the edge. Our increasingly fragile systems are in a state of constant upgrade, and fixes, patches and minor releases rain down from vendors like a virtual hailstorm while the idea of a fixed, stable foundation for our business operations is rushing toward the horizon with its behind on fire.

To quote lyricist Cole Porter on the topic of fashion:

"In olden days a glimpse of stocking, Was looked on as something shocking, But now, God knows, anything goes."

Sounds like the world of networking. Is this a great business to be in or what?

*Is it taupe or just some shade of creamy brown? Send color samples to [nwcolumn@gibbs.com](mailto:nwcolumn@gibbs.com) or tell me the fashion buzz at (800) 622-1108, Ext. 504.*



Mark Gibbs



## 'NET BUZZ

The latest on the Internet/intranet industry

By Chris Nerney

**IF ONLY WE COULD HIRE THAT de SADE GUY** High-tech start-ups hoping to bag a prestige name to run the company face uncommonly long odds, a survey by a Cleveland-based executive headhunter firm concludes.

Early-stage companies, including Internet contenders, have only a 1 in 30 chance of hiring a CEO with a marquee name (or, as the press release repeatedly spelled it, a "marquis" name).

The **Christian & Timbers, Inc.** survey was compiled from interviews with 141 venture capital firms, 317 high-tech start-ups and several itinerant noblemen.

Company President **Jeffrey Christian** said the demand among new companies for corporate royalty is so high salaries have been priced beyond the reach of most start-ups.

"It's a buyer's market in the CEO business like no other time in history," he said.

Great news if you're a high-profile executive — or a member of French peerage.

**ALL THAT INTERNET TALK WILL PAY OFF** Talk may be cheap, but it is expected to reap nearly \$2 billion in revenues by the year 2001 for companies selling Internet telephony gateways, according to a market study to be released at the end of this month.

In 1996, the three vendors in the market — **VocalTec, Inc.**, **Micom Communications Corp.** and **Vienna Systems Corp.** — split a mere \$4.7 million in revenues, the **Frost & Sullivan** report shows. That revenue total will top out at \$1.81 billion four years from now, the report forecasts.

Telephony gateways link the public telephone networks with the Internet, allowing calls from telephone to PC, PC to telephone or telephone to telephone over the Internet or intranets.

The market has attracted numerous additional companies this year, including **Lucent Technologies, Inc.**, **NetSpeak Corp.** and **Voxware, Inc.**

**"OK, NOW MAKE AN INCISION BELOW YOUR EYE... NO, NOT THAT EYE!"** Somewhere out there exists a unique confluence of Internet technology, wealth, insecurity and narcissism. While we can account for three of the four all by ourselves, **Dr. Edward Domanskis** has managed to assemble the entire package.

Domanskis is a plastic surgeon based in posh Newport Beach, Calif. Having apparently run out of rich clients in the neighborhood, Domanskis has opened a "practice" on the Internet.

Using videoconferencing equipment, patients can get online at a scheduled appointment time and confer face-to-face with the doctor via computer monitor. Domanskis then offers his diagnosis, whether it's a smaller nose, thinner waist or more bandwidth.

You can check out the doctor's site at [www.plasticsurgery-video.com](http://www.plasticsurgery-video.com). Fees are \$250 for a 30-minute cosmetic surgery consultation and \$100 for a reconstructive surgery consultation.

One word of advice: Before he talks you into that expensive face-lift, ask him to try adjusting the contrast on his monitor first.



**ADDING INSULT TO UNEMPLOYMENT** Last Tuesday, software maker **Intuit** announced it would have to lay off 270 employees — 10% of its global workforce — because of slow growth.

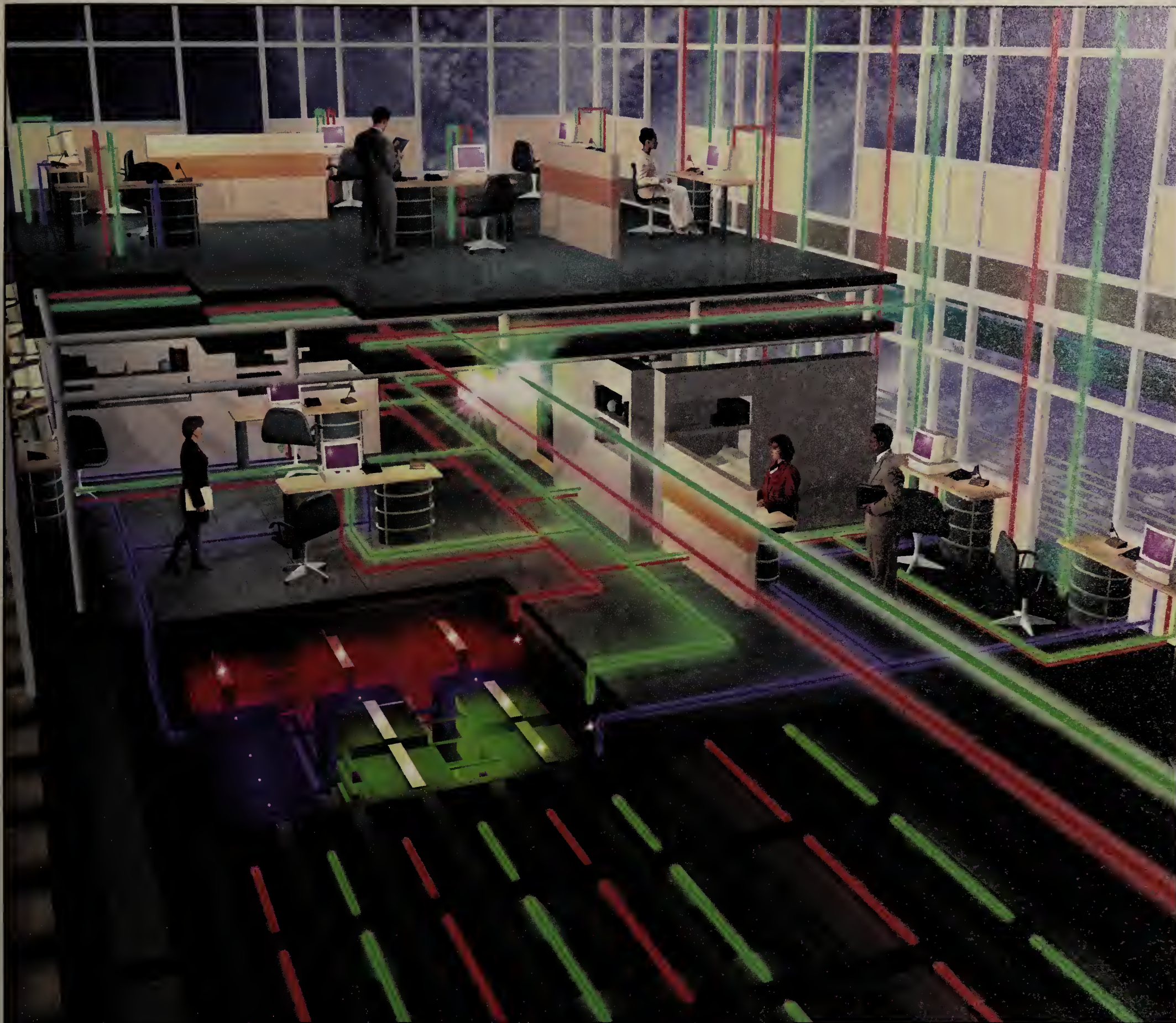
Collectively, those employees must have been making a fortune, for one day later, the Mountain View, Calif.-based company announced it was buying a \$40 million stake — about 19% of total shares — in search engine vendor **Excite, Inc.**

Intuit, maker of **Quicken** software, also announced that Excite, located in Redwood City, Calif., would distribute a personal finance Web channel. No doubt the 270 laid-off workers will avail themselves of this service, since they have plenty of free time to fatten their portfolios.

Now we know why Internet start-up companies can't hire that de Sade guy — he's running Intuit.

*Have you been "done wrong" by someone in the Internet or intranet industry? Remember, 'Net Buzz is the best revenge. Contact Chris Nerney at (508) 820-7451 or [cnerney@nuru.com](mailto:cnerney@nuru.com).*





Before you decide how to  
cable your network, let's talk about  
the cost of managing it.

Your LAN is costing you money. AMP has a cabling plan that can dramatically cut the cost and complexity of managing it. We call it Centralized Network Administration (CNA) and we make it happen by consolidating all your building's LAN electronics in a single closet. It's easier to manage, easier to grow, and easier to migrate to new technologies. Find out more. Call 1-800-835-7240.

AMP Incorporated, Harrisburg, PA 17105-3608. Call **1-800-835-7240**.  
Outside the U.S., please contact your local AMP sales office.

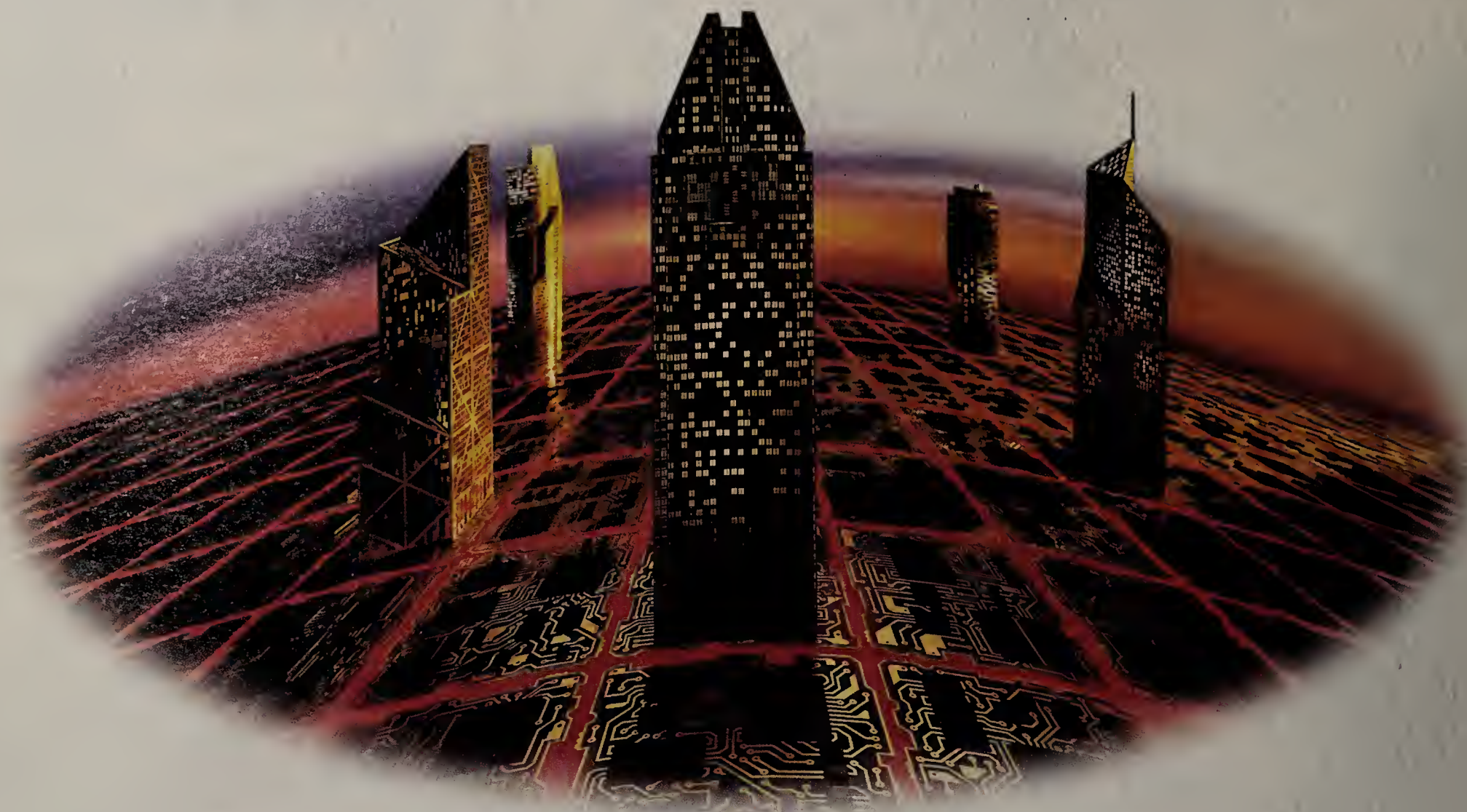
[www.amp.com/networking](http://www.amp.com/networking) AMP and Connecting at a Higher Level are trademarks.





# We saw the future

and we built the architecture to handle it.



The world is changing rapidly, and so are business communications. That's why Sprint looked ahead for its customers and deployed ATM nationwide on a commercial scale before anyone else. In fact,

Sprint is helping set industry standards as a founding member of the ATM Forum. Sprint's ATM network offers the capacity for bandwidth-intensive applications like groupware, production-quality video, and collaborative design in real time. Plus, it integrates all of your communications—from voice to native LAN to Internet—over a single network.

## Only Sprint

deployed the world's first public ATM network for the next generation of data transport.

And we're there every step of the way, to help you evolve your network smoothly as your business grows. Sprint's ATM solution enables our customers to consolidate their networks for management

efficiency and reduced costs. Also, we're moving all our traffic to an ATM backbone to provide increased bandwidth on demand. And coupled with Sprint's core SONET ring architecture, your business applications enjoy outstanding reliability and speed. We knew it was just a matter of time. That's why we looked into the future to bring you ATM today.

Call Sprint Business  
1-800-588-DATA  
[www.sprint.com/data1](http://www.sprint.com/data1)



*We help business do more business<sup>SM</sup>*